Exhibit 50

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

IN RE: VOLKSWAGEN 'CLEAN DIESEL' MARKETING, SALES PRACTICES, AND PRODUCTS LIABILITY LITIGATION

MDL No. 02672-CRB (JSC)

This document relates to:

Napleton Orlando Imports, LLC et al. v. Volkswagen Group of America, Inc. et al., Case No. 3:16-cv-02086-CRB

J. BERTOLET, INC. dba J. BERTOLET VOLKSWAGEN, DIRECT B, LLC dba BRANDON VOLKSWAGEN, a Florida limited liability company, SAI AUTO GROUP, LLC dba BOZZANI VOLKSWAGEN, a California limited liability company, individually, on behalf of themselves and all similarly situated persons and entities,

Plaintiffs,

v.

ROBERT BOSCH, LLC, a Michigan limited liability company, and ROBERT BOSCH GmbH, a German corporation.

Defendants.

Report of Edward M. Stockton In Support of Plaintiffs' Motion For Class Certification

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REPORT OF EDWARD M. STOCKTON IN SUPPORT OF PLAINTIFFS' MOTION FOR CLASS CERTIFICATION

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1. EXECUTIVE SUMMARY

This report analyzes whether Plaintiffs suffered economic harm attributable to the stop-sale orders, Volkswagen's decision to permanently cease selling its diesel-powered (TDI) vehicles in the United States, and Volkswagen's buyback of nearly 400,000 in-use TDI vehicles. Volkswagen has admitted these "Affected Vehicles" contained emissions-cheating software. Volkswagen, two of its executives, and its subsidiary, IAV have admitted their participation in a conspiracy to defraud in connection with the installation of the emissions-cheating software in the Affected Vehicles (the "Alleged Misconduct"). The revelation of the Alleged Misconduct led to: (1) the issuance of the stop-sale orders that halted all sales of new and Certified Pre-Owned (CPO) Affected Vehicles; (2) the permanent cessation of the TDI product lines; and (3) the buyback of in-use TDI vehicles. Counsel have posed the following questions for the purpose of certification of class-wide damage analysis:

(i) Did Volkswagen-branded franchised dealers ("Franchised Dealers") suffer economic loss as a result of the stop-sale order, TDI termination, buyback and other actions flowing from the Alleged Misconduct?

(ii) Is it possible to calculate economic damages suffered by the Franchised Dealers on a class-wide basis?

(iii) Is it possible to isolate the portion of losses suffered by Franchised Dealers that are reasonably attributable to goodwill?

(iv) Can the models employed to estimate economic damages suffered by Franchised Dealers incorporate effects of mitigation that may have occurred or are likely to occur in the future?

The answers to each of these questions is yes. First, there can be little doubt that the abrupt stop-sale orders, then permanent cessation of TDI vehicle sales caused durable economic harm to Franchised Dealers. Volkswagen's TDI models were a substantial portion of the available product line and popular choices for consumers. In fact, Hans Dieter Pötsch, CFO of Volkswagen, identified TDI vehicles as an advantage over its competitors during a presentation to investors in November 2014, just months before the scandal broke.[1] The presentation described "Clean Diesel as a strong [unique selling proposition] in the US." A unique selling proposition is a key feature or benefit that a company chooses to promote to target customers[2] Second, there is ample precedent for modeling the economic impact upon dealerships from the loss of all, or a significant portion of a product line. I have consulted on many such matters, including:

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[1] Hans Dieter Pötsch, "Volkswagen Group: Financial sustainability on core strengths," *Investor Roadshow, Frankfort*, November 24, 2014. https://www.volkswagenag.com/presence/investorrelation/publications/presentations/2014/11-november/2014-11-24+Presentation_HDP_Frankfurt_16-9.pdf

[2] Phillip Kotler, *Marketing Management: Analysis, Planning, Implementation, and Control*, (NJ: Prentice-Hall, 1967).

Mercury. In 2010, Ford announced the discontinuation of the Mercury line in US markets. Prior to Ford's withdrawal of Mercury, most dealerships housed the brand in facilities with Lincoln or with Lincoln and Ford. The loss of the Mercury brand led to a discontinuation of new Mercury sales, the cessation of new Mercury vehicles, which would require parts and service support, entering the market (lost "Units in Operation" or "UIOs"), and the loss of ancillary profits associated new Mercury sales. I calculated the lost profit impact suffered by dealerships in connection with the loss of the Mercury line for several dealerships.

Sprinter. Daimler Trucks introduced its distinctive tall narrow van to the US market in approximately 2001. At this time, Daimler operated as Daimler Chrysler in the US market and initially offered the vehicle to Dodge dealerships, who reportedly showed little interest in the product. Freightliner dealerships, who were equipped to service commercial customers, agreed to sell the product, which Daimler badged as a Sprinter vehicle in the US market. Following a successful product introduction, Daimler sought to transfer the vehicle to Dodge dealerships, in order to leverage the larger dealer network. The proposed transfer to Dodge threatened the new vehicle sales, used vehicle sales, ancillary sales-related profits, and actual and projected unit-in-operation base and its resulting fixed operations opportunity for US Freightliner dealerships. I consulted with approximately 12 Freightliner dealerships in connection with the anticipated product withdrawal and associated lost profits.

Chrysler. In connection with Chrysler's bankruptcy in 2009, the Federal Government mandated the involuntary closure of Chrysler dealerships with the goal of increasing the productivity and profitability of continuing Chrysler dealerships. Dealerships alleged that the Government's role amounted to a Fifth Amendment Takings action and sought compensation. I calculated the lost value of the suite of benefits associated with franchises of two Chrysler dealerships and testified in the Court of Federal Claims. Both dealerships continued to operate with other franchises. The dealerships lost the new vehicle sales, related used vehicle sales, and fixed operations profits associated with the loss of Chrysler products from the overall dealership operations.

Sterling. During the most recent economic downturn, Freightliner withdrew the Sterling product from the US truck market. This withdrawal ceased the flow of new trucks into the market, leaving dealerships with only the residual opportunities associated with units already in the market. I calculated lost profits associated with the withdrawal of the brand.

Other. I also provided consulting services concerning brand termination in connection with GM's withdrawal of the **Oldsmobile** line and **Suzuki**'s bankruptcy and withdrawal of its line from the US market.

The model I propose in this case uses techniques that I employed in the above matters and which are accepted by economists and other retail automotive industry analysts to develop a reliable class-wide estimate of the economic harm suffered by a franchised dealer from the termination or removal of a product line from the market. This is precisely what happened to the Franchised Dealer Class as a result of the Alleged Misconduct. The class-wide estimate of economic damages will apply accepted economic techniques in order estimate the lost profits experienced by Plaintiffs from: (1) the stop-sale orders on Volkswagen TDI vehicles; (2) the

termination of TDI-powered vehicles in the United States; and (3) the buyback of certain TDI models that occurred in connection with the Volkswagen consumer settlement. It is also possible within this analysis to distinguish lost profit that is attributable to goodwill from other lost profits. The models employed to estimate economic harm from each of the above effects of the Alleged Misconduct follow from the structure of the overall profit-generating capacity of franchised dealerships. Consequently, it is possible to incorporate mitigating inputs into the model in order to estimate the degree to which mitigation, if it did or would occur, recaptures or reverses lost profits.

The Alleged Misconduct impaired the profit-generating structure of the Volkswagen-branded franchised dealerships. This systematic effect from the Alleged Misconduct is akin to a termination or non-continuation of the TDI-powered portion of the franchise. The stop-sale order, and subsequent decision by Volkswagen to no longer sell TDI vehicles or any diesel cars in the United States, permanently ceased the sales of new TDI vehicles. The permanent cessation of new TDI vehicle sales deprived the dealerships of both the profits that would have been captured at the point of new vehicle sale and of the related downstream profits that would have arisen from the sales and service associated with the new vehicle. The Alleged Misconduct also resulted in a buyback of certain TDI vehicle models, the consequence of which was to remove those TDI vehicles from the base of existing service customers in the market. The premature removal of TDI vehicles from the market reduced and/or eliminated sales and profit opportunities that otherwise would have continued within the market.

The report also considers the possibility that Plaintiffs took actions that reduced the scope or severity of harm suffered from the Alleged Misconduct ("mitigation"). The proposed model developed within the report can incorporate the potential effects of mitigation, which would include any actions taken by Volkswagen as a result of the emissions scandal in an effort to reduce damages suffered by the plaintiff dealers. This report identifies potential sources of mitigation and sets forth principles for analyzing and, if necessary, quantifying mitigation that does exist. For example, certain TDI vehicles that were repurchased from consumers by Volkswagen have had their emissions systems altered and approved by the Environmental Protection Agency (EPA) and California Air Resources Board (CARB), and these cars have been resold into the US market. The proposed model is capable of accounting for the re-introduction of these previously bought-back vehicles. By employing a lost profit model that is structured upon the profit-generating nature and capacity of franchised dealerships, it is feasible for variables within the model to accommodate adjustments to either point-of-sale or downstream opportunities that change as a result of potential mitigation.

Based upon the data available to me as of the time of this report, I offer the following opinions with a reasonable degree of professional certainty:

(i) It is possible to form estimates on a class-wide basis of the economic damages Plaintiffs suffered as a result of the Alleged Misconduct;

(ii) It is possible to separate lost profits associated with goodwill from those not related to goodwill. It is possible to isolate effects on goodwill based upon the definition of goodwill provided by the Court;

(iii) It is possible to assess potential sources of mitigation and, if appropriate, to estimate effects of mitigation on a class-wide basis; and

(iv) Economic damage calculations on a class-wide basis are preferable to and more reliable than those that would likely result from an individualized damage approach.

2. QUALIFICATIONS

My name is Edward M. Stockton. I am the Vice President and Director of Economics Services of The Fontana Group, Inc. The Fontana Group provides economic consulting services and expert testimony regarding the retail motor vehicle industry and other industries throughout the United States and Canada.

I have a Bachelor's degree in economics from Western Michigan University. I have a Master's degree from the Department of Agricultural and Resource Economics at the University of Arizona. The emphasis of this program was a concentration in applied econometrics. I began my employment at Fontana in the fall of 1998. My first position was as an analyst. Subsequent positions included senior analyst, senior financial analyst, case manager, Director of Economics Services, and Vice President-Economics Services.

My experience in the retail automotive industry encompasses studies, including some now in progress, of hundreds of new motor vehicle dealerships that sell or sold vehicles of one or more of the following line makes: Acura, Audi, Bentley, Buell, BMW, Buick, Cadillac, Chevrolet, Chrysler, Dodge, Eagle, Freightliner, Ford, GMC, Harley-Davidson, Honda, Hyundai, Infiniti, International Truck, Isuzu, Jaguar, Jeep, Kawasaki, Kia, Lexus, Lincoln-Mercury, Lotus, Mack, Mazda, Mercedes-Benz, Mitsubishi, Nissan, Oldsmobile, Peterbilt, Plymouth, Pontiac, Porsche, Saab, Saleen, Saturn, Sprinter, Sterling, Subaru, Suzuki, Toyota, Volkswagen, and Volvo. These studies have been performed both on a consulting basis and in connection with litigation.

These studies of the retail motor vehicle industry have concerned the addition, location, relocation or termination of dealerships, the valuation of dealerships, product line (make and model) discontinuation, the valuation of product lines within franchised brands, the non-approval of dealership buy-sell agreements, manufacturers' systems for allocating new vehicles to dealerships, customer satisfaction measurement, economic damages, retail credit analysis, and other topics. These studies have been performed throughout the United States, and in Canada.

I have testified before state and federal courts, the Court of Federal Claims, the Texas House of Representatives, state-level regulatory and administrative tribunals, and several alternative dispute resolution entities.

I have consulted on several matters relating to the economic impact of the discontinuation of brands and product lines. These include at least Volkswagen, Mercury, Suzuki, Mini,

Oldsmobile, Ford Heavy Truck, Sterling Truck, and the transfer of the Sprinter brand from Freightliner dealerships to Dodge dealerships. I have also testified before the Court of Federal Claims regarding the value of property taken in connection with government actions in the bankruptcy of Chrysler in 2009. In the Court of Federal Claims, I calculated the value of the franchise asset lost by certain former Chrysler dealerships that continued operation without the Chrysler franchise.

I have also consulted on major consumer class actions within and outside the retail automotive industry. These matters include serving as the expert for six classes of consumers and the class of franchise dealers in the Volkswagen Diesel Emissions cases in the United States and Canada.[3] In the consumer matters, I studied economic losses suffered by consumers in connection with the allegedly unlawful sale and marketing of TDI vehicles. In the dealer matter, I modeled damages to dealers from the stop-sale and cancellation of the TDI line and buyback of TDI vehicles in support of Volkswagen's settlement of its liability in that matter. I currently serve as the expert for the class of consumers who potentially suffered credit injury in connection with the Wells Fargo unauthorized accounts matter.[4] In that case, I developed, along with a colleague, a model to estimate increased borrowing costs experienced by consumers as a result of Wells Fargo's allegedly unauthorized account activity. The court approved this model and my administration of the model in the settlement of consumer claims. Several courts in the United States and Canada have cited to my analysis in approving settlements or settlement methods in these and other matters. Many judicial bodies have cited my opinions and analyses in connection with various administrative and regulatory disputes and other matters.[5]

I have appeared before this Court in the Volkswagen Consumer case and dealer case and before Judge Chen in the FCA EcoDiesel emissions case, in which I evaluated economic harm suffered by consumers resulting from alleged emissions cheating software in certain FCA trucks. In EcoDiesel, I evaluated the appropriateness of proposed restitution to affected consumers, given the proposed emissions repair. I also appeared before Judge Chhabria in the Wells Fargo unauthorized account activity litigation.

I have been an invited speaker before groups of motor vehicle dealers, CPAs, Chief Financial Officers of dealer groups, attorneys, and other automotive professionals. A statistical study that I conducted on topics within the transportation industry was submitted to both houses

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[3] *In re: Volkswagen "Clean Diesel" Marketing, Sales Practices, and Products Liability Litigation*, MDL No. 2672 CRB (JSC); *In re: Volkswagen "Clean Diesel" Marketing, Sales Practices, and Products Liability Litigation*, Case No. 3:15-md-02672-CRB (N.D. Cal.), Dkt. 2101; *Option Consommateurs et Francois Grondin c. Volkswagen Group Canada Inc et al.*, Province De Québec District De Montréal Cour Supérieure No: 500-06-000761-151; *Matthew Robert Quenneville, et al. v. Volkswagen Group Canada, Inc., et al.*, Ontario Superior Court of Justice Court File No.: CV-15-537029-00CP; *Judith Anne Beckett v. Porsche Cars Canada Ltd., et al.*,. Ontario Superior Court of Justice Court File No.: CV-15-543402-00CP.

[4] *Shahriar Jabbari and Kaylee Heffelfinger, on Behalf of Themselves and All Others Similarly Situated v. Wells Fargo & Company and Wells Fargo Bank, N.A.*, Case No. 15-cv-02159-vc p. 7.

[5] *Jeff Looper et al. v. FCA US LLC, f/k/a Chrysler Group LLC, et al.*, Case No. 5:14-cv-00700-VAP-DTB; *In re: Volkswagen "Clean Diesel" Marketing, Sales Practices, and Products Liability Litigation*, MDL No. 2672 CRB (JSC); *Rebecca Romeo, Joe Romeo, Diane Béland, and Elyse Choinière v. Ford Motor Company and Ford Motor Company of Canada, Limited*, Ontario Superior Court of Justice Court File No.: CV-15-539855-00-CP.

of the United States Congress on behalf of a union that represents railroad track inspectors. I have been accepted as an expert in state and federal courts, administrative courts, a county court, and binding arbitrations. Areas of accepted expertise include economics, dealer network analysis, statistics, econometrics, dealership operations, dealership finance, analysis of automotive markets, and general knowledge of the retail automotive industry. I have provided deposition and hearing testimony on approximately 70 occasions.

My clients include but are not limited to dealerships (automotive and non-automotive), dealer groups, an automobile manufacturer, a labor union, law firms, manufacturers in other industries, individuals, trade associations, the State of North Dakota, and a variety of professional organizations.

3. RELEVANT FACTUAL BACKGROUND

After admitting the Affected Vehicles (all of Volkswagen's "TDI" models) were designed to detect and pass emissions tests, but otherwise pollute excessively, Volkswagen issued stop-sale orders to Franchised Dealers in September 2015 and November 2015 covering all new TDI vehicles. The stop-sale orders prohibited the sale of new and Certified Pre-Owned TDI vehicles by dealerships, and Volkswagen declared it would no longer sell TDI vehicles or any new diesel vehicles in the United States.

The TDI emissions scandal ultimately resulted in the buyback of nearly 400,000 in-use TDI vehicles from owners and lessees.[6] Volkswagen entities settled civil claims by consumers and regulators and paid over $25 billion in fines and restitution.[7] Bosch also settled consumer claims stemming from its alleged involvement in the emissions scandal. Volkswagen and seven Volkswagen executives and managers were charged with federal crimes based on their roles in the alleged conspiracy. In September 2016, Franchised Dealers settled their claims against Volkswagen for its role in the alleged conspiracy. In January 2017, Volkswagen pleaded guilty to federal crimes stemming from its role in the conspiracy and admitted the existence of the conspiracy. Two Volkswagen executives who were arrested in the United States also pleaded guilty and admitted the existence of the conspiracy.[8] In late 2018, a Volkswagen related entity, IAV, also pleaded guilty and admitted the existence of the conspiracy.[9] On or about May 23,

[6] *Report of Independent Claims Supervisor on Volkswagen's Progress and Compliance related to 2.0 Liter Resolution Agreements Entered October 25, 2016*, November 26, 2018 and *Report of Independent Claims Supervisor on Volkswagen's Progress and Compliance related to 3.0 Liter Resolution Agreements Entered May 17, 2017*, December 13, 2018.
[7] Roger Parloff, "How VW Paid $25 Billion for 'Dieselgate' — and Got Off Easy," *Fortune.com* (February 6, 2018): http://fortune.com/2018/02/06/volkswagen-vw-emissions-scandal-penalties/
[8] United States Attorney's Office, "U.S. v. Volkswagen, 16-CR-20394," December 18, 2018, https://www.justice.gov/usao-edmi/us-v-volkswagen-16-cr-20394
[9] Ibid.

2019, Bosch agreed to pay a fine exceeding $100 million to German authorities in Stuttgart for its role in the TDI emissions scandal.[10]

4. STRUCTURE OF PLAINTIFFS' BUSINESSES/FRANCHISED DEALERSHIPS

The model estimates on a class-wide basis the degree to which Plaintiffs' profitability has changed and will change going forward as a result of the Alleged Misconduct. The foundation of the model is the structure by which automotive dealerships generate sales and profits in the ordinary course of business through new and used vehicle sales and fixed operations, i.e., parts and service business. The well-established economic tool, profit contribution, is the dynamic measure that ties incrementally gained or lost sales to their impact upon a firm or firms' bottom lines.[11] In short, the class-wide model uses the sales and profit structures of retail automotive dealerships to estimate the degree to which a change to the inputs to that structure, the stop-sale orders, permanent loss of the TDI portion of the franchise, and buyback of Affected Vehicles affects the profit output from that structure.[12]

Franchised automotive dealerships, in contrast to independent dealerships, are businesses that engage in some level of exclusive dealing with automotive manufacturers in order to obtain certain semi-exclusive rights to sell and market a brand's products within specified territories. Franchised dealerships are capital-intensive with large overhead structures.[13] Investment in franchised automotive dealerships is highly brand-oriented or "specific." Major automotive manufacturers like Volkswagen mandate certain brand imaging requirements and exercise control over display of trademarks and facility design.[14] In addition to engaging in marketing and promotion of brands' new products, franchised dealerships maintain large infrastructures to service in-use customers of the brand within the market.[15]

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[10] Tassilo Hummel, "Bosch to pay $100 million fine in Germany over emissions-cheat software," *Autonews.com* (May 23, 2019): https://www.autonews.com/suppliers/bosch-pay-100-million-fine-germany-over-emissions-cheat-software

[11] The profit contribution tool is generally accepted in the automotive industry economics community. For example, it was used and approved in final approval of Volkswagen's settlement of its liability in this case (ECF No. 2807), as well as: *In the United States Court of Federal Claims,* No. 10-647C, 11-100C, and 900C Consolidated; *Matthew Enterprises, Inc. v. Chrysler Group LLC, Northern District of California*, San Jose Division, Case No. 5:13-cv-04236-BLF; and *Century Motor Corporation, Inc. v. Chrysler Group, LLC, et al.*, Eleventh Judicial Circuit, Case 1211-CC00371, as well as Belleville Toyota Inc v. Toyota Motor Sales Inc, Appellate Court of Illinois, Fifth Circuit, No. 5-98-0016 and the related Belleville Toyota Inc v. Toyota Motor Sales Inc, Supreme Court of Illinois, No. 90340, among others. See also: Mark Hirschey, *Managerial Economics, Revised ed.* (New York: Harcourt College Publishers, 2000).

[12] Ibid. Also, virtually every automotive manufacturer, including Volkswagen, assesses revenues and expenses on a departmental basis, segregating revenues, gross profits, variable or selling expenses, potentially variable overhead expenses, and fixed expenses.

[13] NADA Average Dealer Profile, 2018.

[14] Volkswagen Dealer Agreement Standard Provisions.

[15] NADA Data Annual Financial Profile of America's Franchises New-car Dealerships, 2018; Volkswagen Dealer Agreement Standard Provisions; Glenn A. Mercer, "Factory Image Programs," February 4, 2012; Glenn A. Mercer, "Factory Facilities Programs: Phase 2," February 2013.

Franchised dealerships, including Plaintiffs, sign distribution agreements ("Dealer Agreements") with the manufacturer[16] that set forth certain general and specific obligations of the parties. In most states, industry-specific statutes or codes regulate certain elements of retail automotive markets.[17] In general, dealerships and manufacturers interact in environments that consider both contractual provisions and relevant state law. Rational investors consider the rights, obligations, and regulations that can and do affect their businesses when buying, building, and operating their dealerships.

5. ECONOMIC STRUCTURE OF RETAIL AUTOMOTIVE INDUSTRY

The retail automotive market operates in multiple stages between manufacture and sale to end-using consumers. Within this successive market structure, or *successive monopoly*,[18] at least two decision-making firms must consider their respective levels of cost and risk, nature and type of investment, and pricing. At the first stage, the manufacturer designs and builds vehicles, with the cooperation and input of component suppliers like Bosch, and sells those vehicles to dealerships, who are the manufacturer's direct customers. At the final stage, the dealership then owns the vehicles and markets and sells them to end-using customers.[19]

Both the automotive dealership and automotive manufacturer are differentiated firms. This concept is perhaps best understood through a hypothetical counter-example. Consider a non-descript convenience store that buys and sells many differentiated branded drinks and snacks but offers little or no differentiation of its own and does not incorporate in any meaningful, continuing manner, the trademarks or branding elements of the products it sells. This hypothetical example contrasts with the retail automotive market in which both the manufacturer and dealership participate in the marketing of the brand's products. Unlike an undifferentiated seller, dealership investments in both short-term and long-term resources tend to be specific (facility appearance, brand imaging, brand-specific training, brand advertising, etc.). Additionally, the dealership expends significant effort and expense in both pre-sale marketing and service and post-sale resources. The dynamics of the successive monopoly market are material to shaping the investment, revenue, and expense structures of franchised dealerships.[20]

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[16] "Manufacturer" is intended to include "distributor", which for non-US brands like Volkswagen is a U.S. based subsidiary.

[17] A non-exhaustive set of examples includes Cal. Veh. Code § 3060-3069.1; Iowa Code § 322A; and Tex. Occ. Code § 2301.

[18] See Bresnahan, Timothy F., and Peter C. Reiss. "Dealer and Manufacturer Margins," *Rand Journal of Economics*, 16, no. 2 (Summer 1985): 253-268; Joseph J. Spengler, "Vertical Integration and Antitrust Policy," *The Journal of Political Economy*, 58, no. 4 (August 1950): 347-358.

[19] Some United States manufacturers have third-party independent distributors who add additional stages to the market structure. This is not the case with Volkswagen.

[20] Volkswagen Dealer Agreement Standard Provisions; Robert Dorfman and Peter O. Steiner, "Optimal Advertising and Optimal Quality," *The American Economic Review*, 44, no. 5 (December 1954): 826-836; Bresnahan, Timothy F., and Peter C. Reiss. "Dealer and Manufacturer Margins," *Rand Journal of Economics*, 16, no. 2 (Summer 1985): 253-268; Riordan, Michael H. "Competitive Effects of Vertical Integration," Columbia University: Department of Economics Discussion Paper Series, Discussion Paper No.: 0506-11, November 2005; Salinger, Michael A. and

The differentiated nature of both the automotive manufacturer and dealership means that both parties have some level of market power. When two firms with market power act individually within the same economic system, structural friction inherently exists. In the retail automotive market, this friction affects cost and risk allocation between the parties, the degree and amount of specific investment, the optimal or preferred levels of retail sales volume and price. In general, the manufacturer or dealership would choose different levels of each of the aforementioned inputs/outcomes in order to maximize its own well-being. Furthermore, it is generally true that changes to retail market price or the specificity of dealership assets toward the preferred level of one participant results in a welfare transfer. The direction of the welfare transfer is from the party making the change to the party whose preferred outcome is approached by the change.

6. COMPETING DEALERSHIP ECONOMIC INCENTIVES:

Dealerships straddle competing sets of economic incentives. For franchised dealerships, new vehicle sales drive the long-term opportunities for sales and profitability. However, in the near term, marketing efforts intended to direct and leverage existing demand in the market are generally more cost effective than conquest advertising.[21] Furthermore, transactional margins on used vehicles tend to be higher than those captured on new vehicle sales.[22] Manufacturers, whose profit opportunities come from new vehicle sales and the sale of licensed parts for repairs of branded vehicles, clearly prefer that dealerships undertake relatively more inter-brand competitive efforts with a higher emphasis on new vehicle sales.

In response to the inherent structural friction within the successive monopoly market structure and the competing economic incentives faced by dealerships, manufacturers administer programs that limit the degree to which dealerships' operational choices can differ from those desired by the manufacturer. In economic literature, these programs and techniques are known as "vertical restraints." In practice, vertical restraints appear as purported minimum sales requirements ("sales effectiveness" or "sales efficiency"), volume-based incentives (VBIs) that condition the ultimate net wholesale prices of vehicles upon dealer achievement of pre-set new vehicle sales volumes, product allocation systems that supply disproportionate levels of scarce resources to dealerships that adopt faster-selling sales models, and joint advertising programs ("co-op") that share costs of approved advertising content. These programs are in addition to facility requirements, capitalization requirements, image standards and other programs that regulate the size and appearances of dealerships.

Alexander Elbittar. "White Paper on Vertical Restraints," CRC America Latina, May 2013; Verouden, Vincent. "Vertical Agreements: Motivation and Impact," In 3 issues in *Competition Law and Policy*, ed. W.D. Collins (American Bar Association, Section of Antitrust Law, May 2008), 1813; "Theory of Asset Demand," *Intelligent Economist* (August 1, 2017): http://www.intelligenteconomist.com/theory-of-asset-demand; "The Stock Market: Risk vs. Uncertainty," *Federal Reserve Bank of St. Louis* (Fall 2002).

[21] Phillip Kotler, *Marketing Management: Analysis, Planning, Implementation, and Control*, (NJ: Prentice-Hall, 1967). Conquest advertising may be referred to as "advertising as a public good", "persuasive advertising," or "inter-brand."

[22] NADA Data Annual Financial Profile of America's Franchises New-car Dealerships, 2018.

I have consulted with dealerships of virtually every brand with which Volkswagen competes, and I am not aware of any brands that do not mandate certain levels of sales, either through program or contractual mandate or through differential wholesale pricing. Furthermore, each of these brands has at least some element of its product allocation system that favors faster-selling dealerships with greater shares of scarce vehicles. Although franchised dealerships are technically independent businesses, both Volkswagen dealerships and their retail competitors face meaningful constraints in the size, shape, and nature of their operations.

Independent market forces also limit the flexibility of Volkswagen and competing dealerships' operations and structures. By way of example, franchised dealerships in close proximity face similar labor markets, real estate costs, construction costs, economic conditions, advertising costs, terrain and weather conditions that affect vehicle choices, and commute patterns. Reducing staff, commissions, advertising, service levels, or certain facility investments are not actions that can be considered in isolation but, instead, will be subject to a market response where forward-looking investment requirements, operational standards, and constraining market forces exert heavy influence over the nature of franchised dealerships in the same market.

Collectively, the need for franchised dealerships to invest in operations of sufficient size and scope to meet customer needs and competitors' investments, the specific nature of investment in branded dealerships, the degree to which contractual requirements and operational programs and standards influence the behavior by franchised dealerships, and the effects of external market conditions limit the flexibility of franchised dealerships to make large-scale operational changes or divestment decisions. Put simply, dealerships cannot curtail their overhead cost structures in quick response to changes in their revenue structures. For this reason, the cessation of the TDI product lines and removal of nearly 400,000 in-use TDIs from the US market directly caused a substantial reduction revenue that was not offset by a reduction in overhead costs. Rather, the relevant effect of the Alleged Misconduct is the direct and foreseeable impact that it had upon dealerships' sales and profits within existing operational structures. Profit contribution is the economic tool used to measure incremental changes in profit that result from incremental changes in sales opportunities.[23]

7. THE STOP-SALE ORDERS AND PERMANENT CESSATION OF TDI MODELS CAUSED ECONOMIC HARM TO FRANCHISED DEALERS

Typically, vehicle manufacturers keep vintages or versions of vehicle models in their product line-ups for many years in between major modifications to those vehicles or prior to cancellation. The intuition underlying product cycles is logical. Retaining a vehicle or a vintage of the vehicle allows the manufacturer to develop and capitalize upon consumer familiarity with a particular model and to achieve production efficiencies, both in order to maximize the manufacturer's return on their substantial investment in creating a vehicle model and advertising it. For example, a manufacturer could spend tens of millions, or even hundreds of millions of dollars to tool a

[23] Mark Hirschey, *Managerial Economics, Revised ed.* (New York: Harcourt College Publishers, 2000).

production facility to make a particular car.[24] The manufacturer is thus highly incentivized to use that tooling for as long as possible before having to reinvest to change it.

Within a vehicle's life cycle, changes to the product ordinarily consist of infrequent vehicle redesigns and more frequent vehicle updates. A redesign generally includes major changes to the chassis, engine, and other components, as well as new or upgraded interiors and features. The more frequent and less dramatic "refresh" (also referred to as a "facelift") of the model typically occurs between model redesigns, and often includes minor updates to features, and styling updates. Models frequently last for multiple life cycles, meaning that while there might be significant changes to the model, it can potentially be sold for many years. During the time that Volkswagen was producing TDI vehicles, the typical life cycle was approximately seven years, with a refresh occurring approximately four years after the redesign.[25] In 2015, Volkswagen introduced major redesigns of the entire TDI line by introducing its third generation ("Gen 3") TDI engine. This brand-new offering would be expected to remain in the product line for at least another five to seven years, and then be updated again. Importantly, nearly four years after the emissions scandal, the TDI engine remains in the product line for Volkswagen vehicles in Europe and other markets other than North America. In fact, while it is no longer selling its diesel cars in the United States, they have continued to release new model year diesels in Europe and elsewhere, though in Germany at least, they now brand cars equipped with the TDI engine as GTD model.[26] Without the cessation of TDI that occurred as a result of the Alleged Misconduct, there is little question that Volkswagen would have continued selling TDI models in the United States well into the future.

A manufacturer's primary long-term economic interest is in the profitable sales of its new vehicles. However, this does not mean that its profits cease at the time of vehicle sale. Manufacturers continue to sell authorized parts and specialized tools, which results in ongoing and increasing profit if a model retains common parts over time and more of the same model cars are sold into the market year after year. The models of Affected Vehicles, including the Volkswagen Jetta, Passat, and Golf, have been sold in the United States for over 39 years,[27] and even the relatively newer Touareg was in the US market for 14 model years.[28] The TDI-powered versions of these cars were introduced into the US market in 2009, and the information in the market until the issuance of the stop-sale orders gave no indication whatsoever that Volkswagen

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[24] Brian Lawson, "Volkswagen's new $1 billion plant up and running in Chattanooga,", *Al.com* (May 25, 2011): http://blog.al.com/breaking/2011/05/volkswagens_new_1_billion_plan.html.

[25] Jason Udy, "Volkswagen to Shorten Product Life Cycle From 7 Years to 5,", *Motortrend.com* (May 30, 2014): https://www.motortrend.com/news/volkswagen-to-shorten-product-life-cycle-from-7-years-to-5/.

[26] "VW Golf GT," *Volkswagen Deutschland*, accessed June 13, 2018, https://www.volkswagen.de/de/models/golf-gtd.html.

[27] Jens Meiners, "Forty Years a Golf: A Pictorial History of VW's Compact Hatch," *Caranddriver.com* (March 31, 2014): https://www.caranddriver.com/news/a15365061/forty-years-a-golf-a-pictorial-history-of-vws-compact-hatch/; David E. Davis Jr., "1980 Volkswagen Jetta," *Caranddriver.com* (July 1, 1980): https://www.caranddriver.com/reviews/a15143340/1980-volkswagen-jetta-archived-instrumented-test/; Jake Holmes, "Volkswagen Passat Celebrates 40 Years of Production," *Motortrend.com* (July 26, 2013): https://www.motortrend.com/news/volkswagen-passat-celebrates-40-years-of-production-389651/

[28] Kelly Pleskot, "Next-Gen Volkswagen Touareg Debuts, but not for U.S.," *Motortrend.com* (March 23, 2018): https://www.motortrend.com/news/volkswagen-next-gen-touareg-debuts-not-u-s/

had any plans to phase out the Affected Vehicles, and it had, in fact, indicated that the brand new car model, the Volkswagen Atlas, would be offered with a TDI engine. All indications were that Volkswagen intended to continue selling TDI-powered vehicles; it continues to sell its cars equipped with TDI engines in virtually all markets except the United States. An August 2013 article in *USA Today* reported that Volkswagen would feature new TDI engines in several of its models for the 2015 line-up.[29] There is no doubt that the significant investment needed to design and produce a new TDI engine for release in 2015 signaled an intent to keep TDI in the line-up for many years thereafter. Even following the TDI scandal and against the backdrop of a planned multi-billion Euro investment in product development toward electric powertrains, Volkswagen expects to continue to produce internal combustion engines through at least 2026, when it plans to release its last vehicles with internal combustion technology.[30] It follows that the sale of TDI vehicles would have continued at least through the end of their subsequent product cycle releases.

The stop-sale orders occurred during a cycle in which Volkswagen offered a highly-publicized sales goal of 800,000 units in the US market by 2018. Within this time period, Volkswagen counted on increased incumbent dealership investment to help fuel the growth. At the 2010 National Automobile Dealers Association (NADA) convention, then-current CEO of Volkswagen of America, Stefan Jacoby, stated that Volkswagen intended to achieve more-than-double its prior-year's sales with roughly the same number of dealerships that were currently in operation. At this meeting, Jacoby encouraged Volkswagen dealerships to continue investing in the brand and offered optimistic expectations of higher profitability and returns.[31] Volkswagen often communicated future years' expected levels of market potential to dealerships when presenting facility guidelines.[32]

When Volkswagen announced that the stop-sale orders were permanent and it would no longer sell *any diesel vehicles* in the United States, the stop-sale orders became a complete termination of the TDI portion of the Volkswagen franchise. All that remained was the opportunities associated with vehicles already in the market. Thus, the stop-sale orders resulted in not just the inability of Franchised Dealers to sell—and then service—the new TDI vehicles on their lots, it resulted in the inability to sell—and then service—new TDI vehicles for the entire remaining period of the TDI product lines, which, as noted above, was at least through 2022 or 2024, based on the anticipated release of the new Atlas. Furthermore, the buyback of

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[29] Kelsey Mays and Fred Meier, "Volkswagen will offer new TDI diesel engine," *USA Today* (August 6, 2013): https://www.usatoday.com/story/money/cars/2013/08/06/volkswagen-tdi-passat-jetta-beetle-golf/2624677/

[30] Christopher Rauwald and Oliver Sachgau, "VW says the next generation of cars with combustion engines will be its last," *Autonews.com* (December 4, 2018): https://www.autonews.com/article/20181204/OEM04/181209877/vw-says-the-next-generation-of-cars-with-combustion-engines-will-be-its-last

[31] James M. Amend, "Volkswagen U.S. Sales to Double; Dealer Count to Remain Flat," *Wardsauto.com* (February 13, 2010): https://www.wardsauto.com/news-analysis/volkswagen-us-sales-double-dealer-count-remain-flat

[32] See *Volkswagen Dealer Profile* report. The document Bates numbered BOZZVW00005026 contains an example of a Volkswagen Dealer Profile.

TDI vehicles arrested the flow of commerce between Volkswagen dealerships and owners of most TDI vehicles that were already in the market at the time of the stop-sale order.

8. OVERVIEW OF ECONOMIC CONCEPTS:

Sections A through I below provide overviews of the elements of the economic model employed. A following section of the report, along with supporting tabs, analyzes these concepts in more detail. At the time of drafting this report, discovery is ongoing. Thus, this report is not intended to provide final conclusions about the dollar amount of economic harm suffered by the Franchise Dealer Class. Rather, it is intended to show the capacity of the proposed model to incorporate elements of economic harm, potential mitigation, and potential offsets to damages and to do so on a class-wide basis.

A NATURE OF ECONOMIC LOSS:

Franchised dealerships hold certain rights to engage in the promotion, sales, and service of the products of their affiliated brands. A non-exhaustive list of these rights includes the display of trademarks, the rights to market, display, and sell certain authorized products, such as new and certified pre-owned vehicles, the ability to perform warranty work and acquire authorized parts, access to training, special service tools, and service codes, and the limited ability to exclude some marketing and sales activities of potential competitors within contractual territories. Profit opportunities include the sale of new vehicles and ancillary products, the sales of used vehicles and ancillary products, the favorable acquisition of used vehicles through trade-ins and franchise-specific channels like closed auctions and lease returns, and fixed operations activities including a variety of parts sales opportunities, warranty parts and service sales, and customer pay activities. Profit accrues to the dealership at the original point of sale of a new vehicle, but it does not end there. Once in the market, the vehicle requires additional services, which include highly profitable interactions, such as customer pay and warranty service work, and the sale of customer pay and warranty parts to private and commercial customers. Furthermore, vehicles already in the market return to dealerships for reconditioning, the grounding (completion) of leases, and ultimate sale to additional retail customers.

B. THE STOP-SALE ORDERS:

In September 2015 and November 2015, immediately following the each Notice of Violation issued by the EPA to Volkswagen, Volkswagen issued separate stop-sale orders for its TDI vehicles.[33] The first ceased the sales of 2.0-liter vehicles; the second ceased the sales of the Volkswagen Touareg, which had a 3.0-liter TDI engine, as well as certain Audi and Porsche vehicles also equipped with 3.0 liter TDI engines. The stop-sale orders immediately halted the

[33] Kelly Pleskot, "Volkswagen Issues Stop-Sale on Diesel Cars Following Emissions Scandal," *Motortrend.com* (September 21, 2015): https://www.motortrend.com/news/volkswagen-issues-stop-sale-on-diesel-cars-following-emissions-scandal/; Kelly Pleskot, "VW Issues Stop-Sale on Cars with 3.0-Liter TDI V-6 Engines," *Motortrend.com* (November 4, 2015): https://www.motortrend.com/news/vw-issues-stop-sale-on-cars-with-3-0-liter-tdi-v-6-engines/.

sales of new and CPO TDI vehicles. The arrested sales of new and CPO TDI vehicles also prevented those TDI vehicles that would have been sold from becoming in-use vehicles within the market. Collectively, the stop-sale orders deprived Franchise Dealers of the profits associated with: (1) new TDI sales, including profits on the vehicle sales themselves and on ancillary related products; (2) used vehicle sales that would have flowed directly from the new TDI sales; and (3) the fixed operations sales, including warranty, customer pay, and wholesale sales. The effect of the stop-sale orders related most closely to a franchise termination or discontinuation, in that the profit opportunities that flowed to dealerships from the TDI vehicle portion of the Volkswagen franchise ceased, leaving behind only the residual value associated with the in-use TDI vehicles in the market. This cessation became permanent when Volkswagen declared it would no longer sell TDI vehicles or any other diesel vehicles in the United States.

C. THE CONSUMER SETTLEMENTS AND TDI BUYBACK:

The Emissions Defect underlying the stop-sale orders fueled myriad legal actions on behalf of various stakeholders, including consumers who owned or leased Volkswagen vehicles, purchasers of Volkswagen-backed securities, the Federal Trade Commission and the US EPA acting through the Department of Justice ("DOJ"). In connection with a global class-action settlement with TDI vehicle owners, the FTC and the DOJ, Volkswagen agreed to buy back all 2.0-liter TDI vehicles and 2009-2012 model year (MY) 3.0-liter TDI Touaregs.[34] As described in more detail below, the buyback resulted in the removal of approximately 78% of then in-use Volkswagen TDI vehicles from the US passenger fleet. This made the harmful effects to dealers of the Alleged Misconduct even more profound because not only was the TDI portion of the Volkswagen franchised removed, as described above, but even the residual earnings from the in-use vehicles were stripped from dealers as nearly 400,000 TDIs were sold back to Volkswagen. The midpoint of the buyback occurred in March 2017. The effect of the buyback is distinct from that of the stop-sale order. It removed 78% of in-use vehicles, reducing the residual value of TDI vehicles to franchised dealerships by prematurely terminating fixed operations (parts and service) opportunities associated with those vehicles.

D. CLASS-WIDE ELEMENTS OF ECONOMIC DAMAGE

Plaintiffs suffered economic harm in connection with the abrupt and permanent discontinuation of the TDI portion of their Volkswagen franchises. It is helpful to consider this harm in three parts. The first is the economic harm associated with the stop-sale orders. This is harm from the permanent cessation of new TDI vehicle sales by the Franchise Dealer Class and includes the lost profits associated with sales and the profits from fixed operations (i.e., service and parts) that these vehicles would have generated post-sale as in-use vehicles within the market. The second is harm from the buyback. Harm from the buyback is elimination of the value of in-use vehicles already within the market. The second category of harm does not depend upon the first and is entirely additive. The third category of harm relates to Plaintiffs' changes in

[34] *Order Granting Final Approval of the 2.0-Liter TDI Consumer and Reseller Dealership Class Action Settlement* and *Order Granting Final Approval of the Consumer and Reseller Dealership 3.0-Liter Class Action Settlement.*

operating environment following the revelation of the emissions fraud. This category includes potential harm from sources such as the slowing or cessation of fixed operations encounters relating to in-use vehicles between the stop-sale orders and the buyback, the diminished ability to recruit and retain qualified personnel at the prevailing costs that would have existed but-for the Alleged Misconduct, costs of acquiring replacement inventory for TDIs stranded on dealerships' lots, and customer handling costs in connection with fallout from the emissions scandal.

The class-wide model presented herein estimates economic damages associated with only the first two categories of harm, but not the third. Whereas the first two categories of harm represent lost profits associated with the premature termination of ongoing commerce, the third category evaluates the manner in which dealerships incurred harm as a result of ameliorating the harm from the stop-sale order or generally faced operational changes as a result of operating their Volkswagen franchises in the post-emissions scandal environment, rather than the environment that would have existed but for the Alleged Misconduct. I address this concept in more detail in the mitigation section of the report.

E. GOODWILL

The Court's Order Denying Bosch's Motion to Dismiss[35] in this matter identifies goodwill as an intangible element of economic harm that is not eligible for recovery under Plaintiffs' RICO claim. I have reviewed the Order, in which the Court defines goodwill as "the positive reputation a business may enjoy in the eyes of the public that creates a probability that old customers will continue their patronage."[36] This is a definition of goodwill that is accepted in the economic literature, as noted by the Court, and is rationally used in this scenario. Under this definition, it is possible to isolate economic harm to Franchise Dealers' related to goodwill, in order to eliminate that harm from the aggregate damage calculation for Plaintiffs' RICO claim.

The model incorporates the Court's definition of goodwill by applying a direct offset to lost new vehicle sales based upon Volkswagen's return customer propensity in 2017. The source of this statistic is a study by noted automotive information services provider Edmunds Automotive that estimates the percentages of customers who return to the Volkswagen brand. Using the Edmunds Loyalty Report and a 2016 Automotive Dealership Loyalty Study by market research firm MaritzCX, it is also possible to estimate the percentage of customers who return to the Volkswagen brand ("Brand Loyalty") and the percentage who return to the same Volkswagen dealership ("Dealership Loyalty"). Since the model estimates class-wide damages, it applies the higher (37%) Brand Loyalty propensity, rather than the lower and more restrictive dealer return propensity. While the Edmunds study was performed after the disclosure of the Emissions Defect, the brand return propensity is several percentage points higher in 2017 than in a similar study Edmunds completed in 2007 (37% in 2017 vs. 34% in 2007). The use of the 2017

[35] *Order Denying Bosch's Motion to Dismiss the Volkswagen Branded Franchise Dealers' Second Amended and Consolidated Class Action Complaint*, p. 11.
[36] Id.

study is, therefore, conservative because it causes the model's goodwill-related reduction in damages to be greater than it would be if the pre-scandal 2007 study were used.

When analyzing lost sales more than six years after the stop-sale order, certain would-be returning customers would not have been customers as of late 2015. Customers who were not Volkswagen customers as of the stop-sale order would not be subject to the goodwill offset. The appropriate goodwill offset for 2022 and later years, therefore, is to consider the return of customers who would have purchased TDI vehicles between the stop-sale orders and 2021, mathematically, 37% of the original 37% return customer offset. However, whether goodwill sales encompass all returning Volkswagen customers, whenever captured—in which case the goodwill offset would be static at 37% of the 6-year prior sales; or just returning Volkswagen customers from before the emissions scandal—in which case the goodwill offset beginning in 2022 would be 37% of 37% of the 6-year prior sales, the model can make the appropriate adjustment.

I am aware of Bosch's arguments in the Motion to Dismiss in the *Saavedra* case in the MDL that all lost TDI vehicle sales except for cars on Franchise Dealers' lots are goodwill damages and/or too speculative to be recovered. As an economist and an expert in the retail automotive industry and marketplace, I view this as an untenable position. In order for Bosch's argument to offer a correct definition of *goodwill damages*, it, first, must relate to a reasonable definition of goodwill in general. It does not. Under Bosch's argument, since profits from all lost TDI sales qualify as *goodwill* damages, goodwill, in general, must equate to all future sales. This position does not distinguish between return customers and new customers. On average, 63% of the customers who go into a Volkswagen dealership and buy a car *are not returning customers*, and thus, by definition, these sales cannot be the result of the dealers' goodwill.

An argument that all future sales are goodwill related does not distinguish between characteristics of the business that, *ex ante*, create the tendency for customers to return, and those whose return is influenced or won by subsequent efforts. Essentially, it treats all potential current and future customers as returning Volkswagen customers, which although clearly not a realistic position, is the necessary position to adopt in order to assume that profits from all future sales represent goodwill, and the loss of those profits represents *goodwill damages*. The retail automotive industry and other sources recognize the distinction between inter-brand and intra-brand competition, cannibalized sales and conquest sales, and return customers and new customers.[37] Bosch's argument does not comport with these distinctions or what I understand to be the definition of goodwill adopted by the Court, which is "a probability that old customers will continue their patronage."

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[37] Phillip Kotler, *Marketing Management: Analysis, Planning, Implementation, and Control*, (NJ: Prentice-Hall, 1967); New Motor Vehicle Bd. v. Orrin W. Fox Co., 439 U.S. 96 (1978). Additionally, Volkswagen tracks and analyzes "Buyer Behavior" reports that evaluate strictly intra-brand sales captures within and across markets and "Product Popularity Reports" that track registration effectiveness, or Volkswagen's inter-brand capture levels. These reports, regularly processed by Volkswagen and other manufacturers, distinguish intra-brand competition from inter-brand competition, cannibalized sales vs. incremental sales.

F. MITIGATION

Conceptually, Plaintiffs economic losses could be mitigated if their new vehicle sales of non-TDI models increased for reasons directly attributable to the discontinuation of TDI vehicles. For example, if Volkswagen accelerated new model releases, eased production constraints, or executed successful model redesigns *because of the cancellation* of TDI vehicles, mitigation could result. Additionally, customers who would otherwise purchase TDI vehicles but purchase other Volkswagen vehicles because the TDI vehicles are not available may represent mitigating sales. However, potentially mitigating sales are subject to the same goodwill limitations as are lost TDI vehicle sales. That is, the same 37% fraction of lost TDI vehicle sales attributable to goodwill applies to sales of mitigating non-TDI replacement vehicles. Put another way, if a prior Volkswagen customer would have returned to a Volkswagen dealer to buy a TDI vehicle, but could not as a result of the Alleged Misconduct, that lost sale would be part of the 37% goodwill fraction and would not contribute to the dealer's lost profit constituting RICO damages. Concomitantly, however, if that same returning customer elected instead to buy a different Volkswagen in place of the TDI vehicle she originally sought, that new sale would also not be mitigation for purposes of lost profits constituting RICO damages since the customer is a returning customer.

Following the buyback of TDI vehicles, Volkswagen released for sale and continues to release for sale certain of the Volkswagen buyback program TDI models which can achieve emissions compliance after dealer-installed powertrain modifications. In isolation, the re-entry of these vehicles into the market represents the return of only a subset of the TDI vehicles that would have been otherwise available for sale and service but-for the Alleged Misconduct. However, it is possible that these returning used vehicles provide some offset of economic harm. First, it is my understanding from speaking to Volkswagen franchised dealerships that they perform a compensated powertrain modification in order for the returning vehicles to be eligible for sale. Second, it is possible that the return of the repurchased vehicles to Volkswagen dealerships represents an increase in sales of used TDI vehicles, at least in some time periods, over what would have occurred had the vehicles continued to flow through conventional sales channels. Third, the repurchased vehicles restore some of the lost in-use TDI vehicles eliminated from the market through the buyback. Counsel has served discovery requests on Volkswagen for information on the reintroduction of repurchased TDI vehicles into the US market. When obtained, this information can be incorporated into the proposed model to fully account for all three of the mitigating effects created by the return to the market of these repurchased vehicles.

The use of a class-wide economic model that is based upon the profit structure of franchised dealerships allows for feasible estimation of any potential effects of mitigation that may offset economic damages. In other words, to the extent the evidence shows that dealerships increased new non-TDI vehicle sales directly as a result of the loss of TDI sales, the mitigating new sales can flow through the lost profit model in the same manner as the lost new vehicle sales—only with the direction reversed. Furthermore, if the hypothetical mitigating new vehicle sales result in increased indirect profit opportunities, such as used vehicle sales or fixed

operations opportunities with existing customers, the lost profit model can readily accommodate those adjustments in the same manner that it did for the lost profits.

With respect to repurchased used vehicles returning to the market, the proposed model can easily incorporate their effects on dealership profitability through adjustments to used vehicle profit contribution, incremental fixed operations revenue and profits, and restoration of the base of in-use vehicles. The class-wide lost profit model could accommodate each of these potentially mitigating effects in the same manner that it evaluates lost sales and profits in those departments. As would be the case with any potential mitigation of new vehicle profits, it would be necessary to consider any potential mitigating used vehicle sales in the context of goodwill considerations. That is, mitigating profits are reduced in an equivalent manner as lost profits as a result of sales attributable to returning customers (goodwill).

9. The Class-wide Damages Model

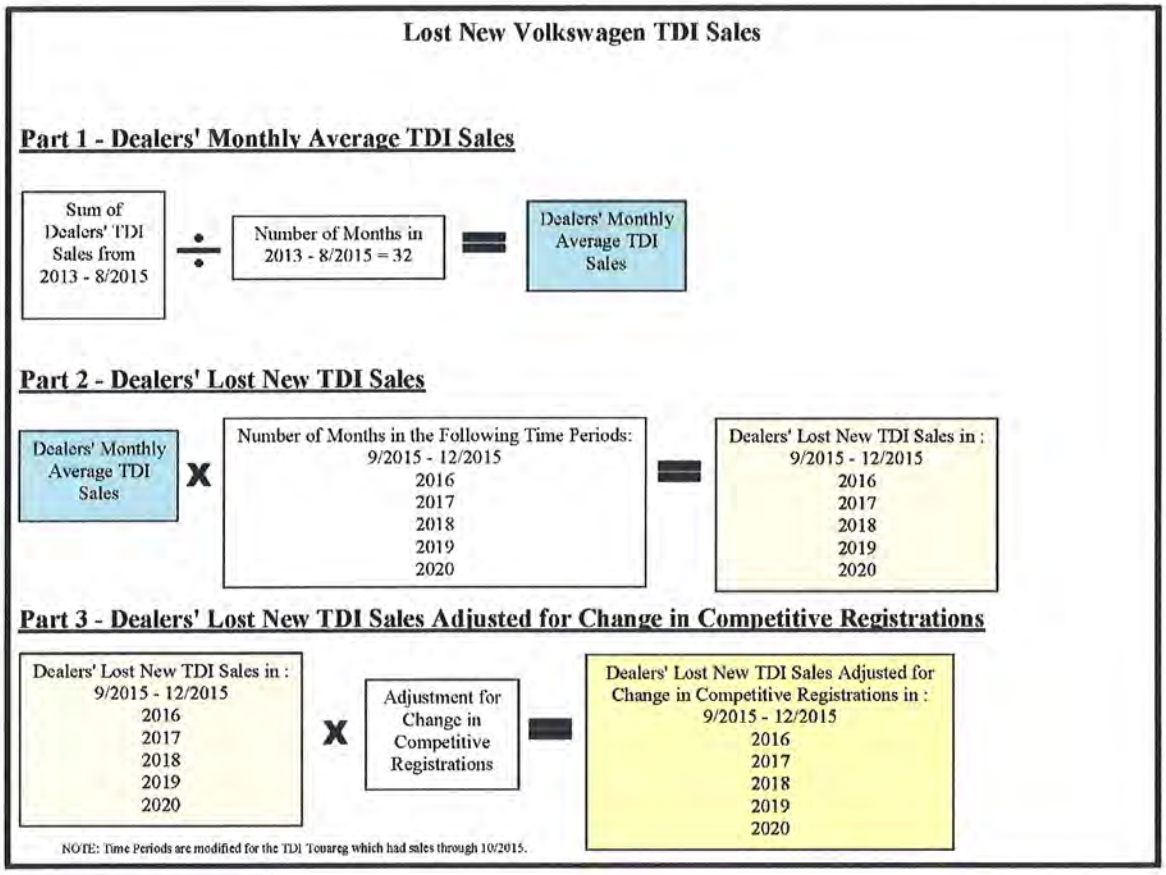
A. LOST NEW TDI SALES

The first input of the lost profit model flows from the stop-sale orders, which ceased the flow of new TDI vehicles from Volkswagen to Franchised Dealers and on to the retail market. This input requires a calculation of new TDI vehicle sales that would have occurred but for the termination of the TDI vehicle portion of the franchise. The basic elements of this calculation are a baseline level of sales in the period leading up to the stop-sale orders and an adjustment for market conditions that have changed since the baseline time period. The diagram below derives sales forecasts using a base period of January 2013 through August 2015 ("Base Period"). The base period includes the time periods immediately prior to the stop-sale orders and is a time period that is most feasible from the standpoint of data availability. However, the model could accommodate different base periods if necessary.

The model assumes that the average TDI vehicle sales from the Base Period would continue unless changed by external market forces. This is a conservative assumption because Volkswagen had just released a newly designed TDI engine in 2015 and was itself projecting continuously increasing sales volumes for its products.[38] The effects of external market forces can be objectively and conservatively gleaned from Competitive Registrations data. The model's estimated sales include an adjustment factor for the change in Competitive Registrations that has occurred since the Base Period. Competitive Registrations are made up of vehicles deemed to compete with Volkswagen products, or in this case, TDI vehicles. Virtually all automotive manufacturers, including Volkswagen, employ factors like the Competitive Registration factor to adjust expected sales volumes based upon the numbers and types of vehicles that consumers purchase. The Competitive Registration factor controls for market-wide variables that would affect the sales of all vehicles, for example, if consumer preferences shift toward SUV-style cars, or there is a recession, or the cost of fuel changes dramatically so that preferences shift from

[38] David E. Zoia, "Passat CC Kicks Off VW's Drive to 800,000 Sales in U.S.," *Wardsauto.com* (January 13, 2008): https://www.wardsauto.com/news-analysis/passat-cc-kicks-vw-s-drive-800000-sales-us.

small cars to large cars, or vice-versa. The use of the Competitive Registration factor is conservative since it does not account for the possibility that Volkswagen would, rationally, alter its product emphasis toward growing product segments and away from declining product segments.

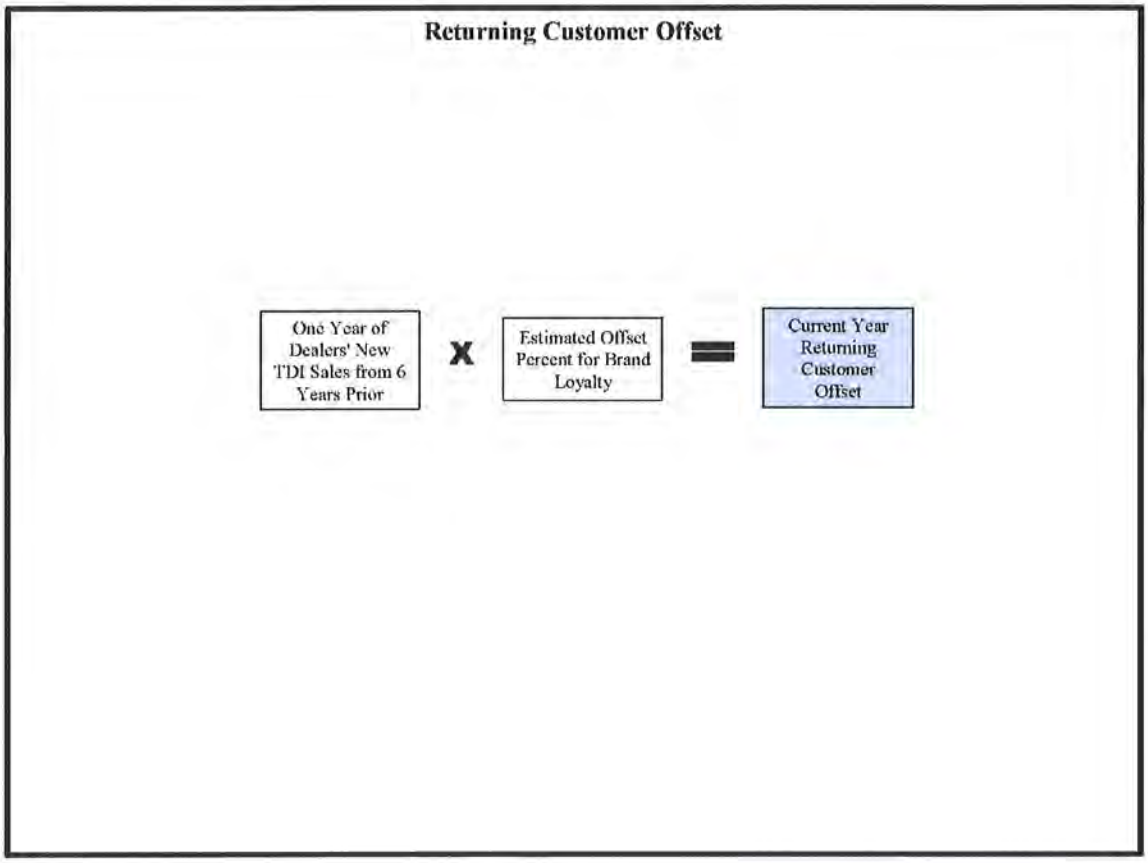


B. RETURNING CUSTOMER (GOODWILL) OFFSET

The model for determining RICO damages adjusts for goodwill by applying an offset for returning customers who would have been part of the TDI vehicle sales forecast. The offset eliminates from the damages calculation the profits derived from these expected new TDI vehicle customers who would have been returning to the Volkswagen brand. The magnitude of the returning customer offset depends upon two factors. The first is a six-year average duration of new vehicle ownership.[39] The second, as described earlier, is the percentage of Volkswagen's customers who return to purchase another Volkswagen vehicle. Thus, the overall Returning Customer Offset takes into account Volkswagen's return customer propensity and the relative TDI vehicle sales volumes that existed at the time of the customer's original purchase and at the

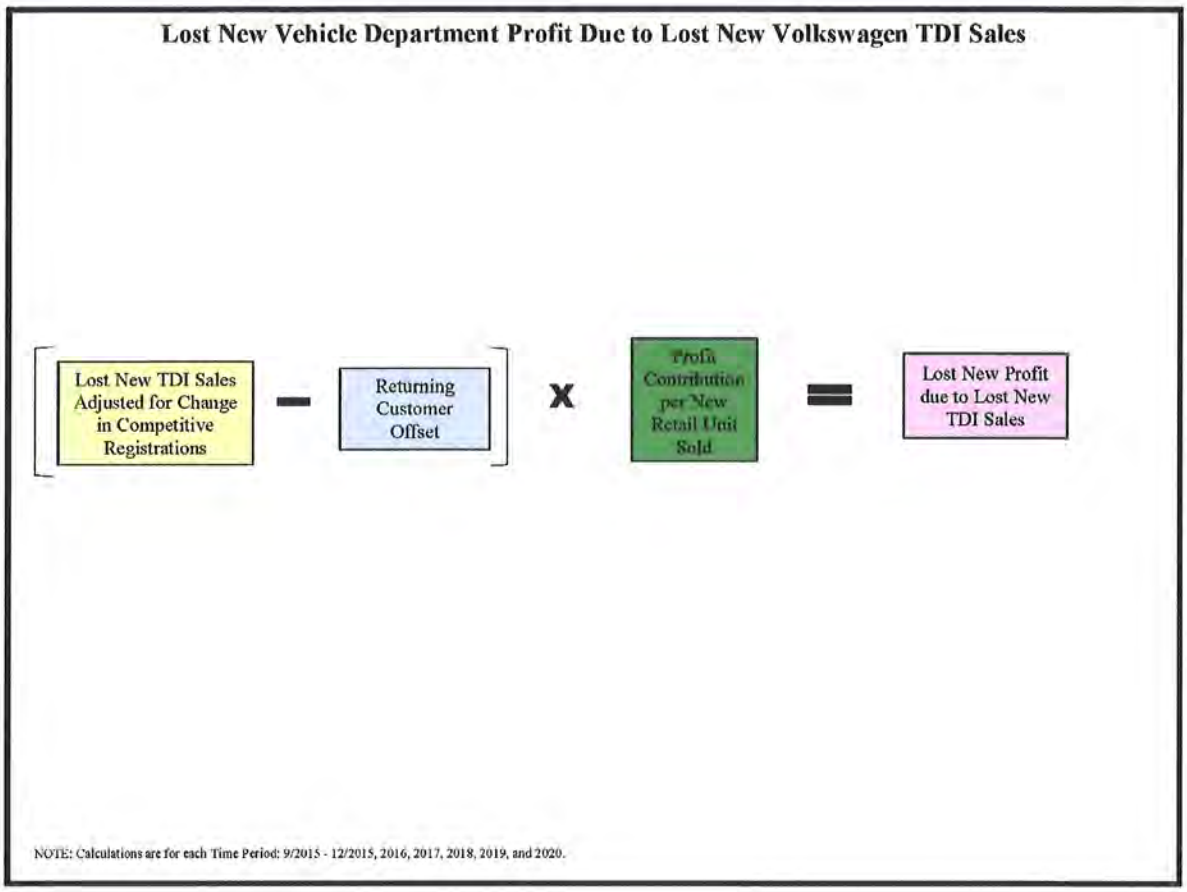
[39] Edmunds Loyalty Report, 2018.

time of the return to the market. The goodwill offset employed is inherently conservative. It does not account for the fact that dealerships would need to make continued efforts and investments to draw returning customers to the brand in the future, and instead assumed that current goodwill, absent future investments, is the characteristic of the business that creates the probability that customers will return.



The model estimates lost profitability from lost new vehicle sales, and from other departmental sales, by applying the actual profit contributions earned by Plaintiffs in the sale of new vehicles during the Base Period to the lost sales for that year. By way of example, if the Franchised Dealer Class lost an estimated 50,000 new TDI sales in 2017, and the Class retained an average of $1,000 of profit contribution per new retail vehicle sold, the lost profit contribution from new TDI vehicles in that year would be $50,000,000, which would be adjusted to current year dollars as appropriate. The illustration that follows displays the application of the profit contribution margins and the progressive adjustment to estimated new vehicle sales volumes from the Returning Customer Offset and the Competitive Registration Factor.

C. LOST PROFIT DUE TO LOST NEW TDI SALES (NET OF GOODWILL)



D. PROFIT CONTRIBUTION

The profit contribution calculations are based upon the standard economic construction,[40] by which a firm earns incremental profits from sales when the additional expenses necessary to make the sales are lower than the additional revenues acquired—alternatively, marginal profit equals marginal revenue-less-marginal costs. Specifically, profit contribution margins for each department equal sales price less cost of goods sold, less variable expenses, and less the portion of semi-variable expenses that move with sales volumes. Examples of variable expenses include sales commissions, technician wages on service repairs, and floor plan interest. Semi-variable expenses include items that vary in the same direction as sales volumes but lack transactional components and tend to be less sensitive to volume changes. Telephone expenses, lot porters, and certain administrative personnel tend to generate semi-variable expenses. The profit contribution segregation of expenses is consistent with the financial statements designed by automotive manufacturers for their dealerships. These statements segregate clearly variable expenses from more stable overhead expenses, like personnel costs. For ease of

[40] See note 16 above.

presentation, and because of the close relationship between dealerships' parts departments and service departments, I have combined the profit contributions of the two departments. The model would readily accommodate the separate presentation of the departments, if necessary.

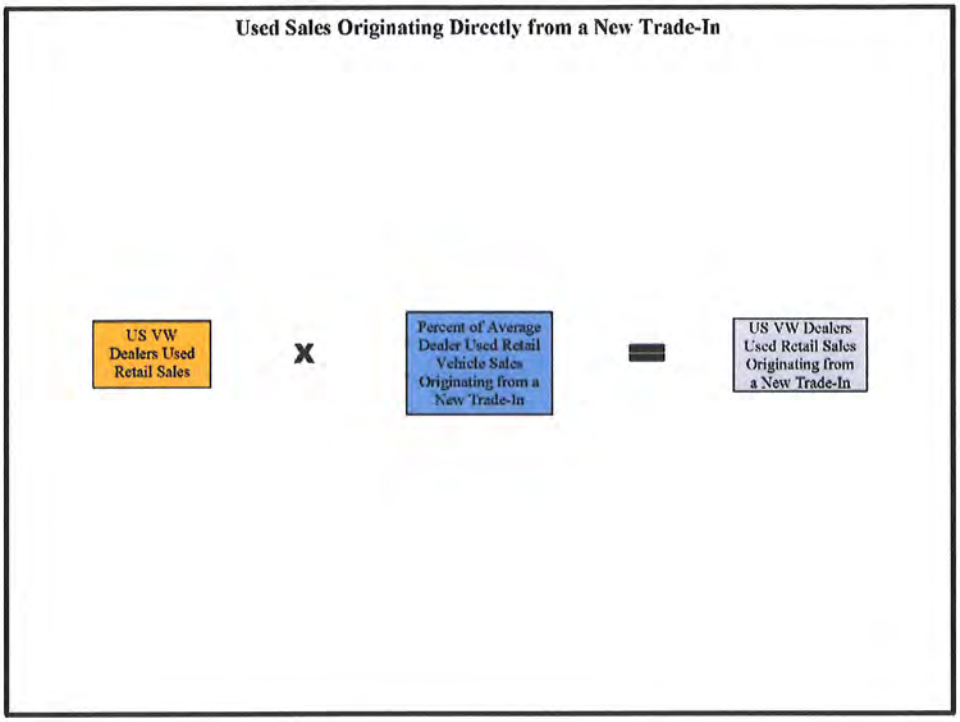
E. USED VEHICLE SALES

The model applies a conservative factor to account for lost used vehicle sales. Franchised dealerships acquire and resell used vehicles that they receive from lease grounding, factory auctions, programs (direct sales from the factory), trade-ins, and other acquisition sources. However, the model only considers only the lost used vehicle sales that would have been generated directly in connection with the sales of new TDI vehicles, namely trade-ins. This estimate of lost used retail sales from trade-ins is based upon the propensity of new vehicle sales to generate trade-ins, which, in turn, result in used retail vehicle sales. Although dealerships have other sources of used vehicle sales, like auctions and off-lease vehicles, the propensity of new vehicle sales to generate used retail vehicle sales occurs in the context of other sources of used vehicle sales. Including off-lease vehicles not acquired in connection with new vehicle sales, increased supply of Volkswagen auction vehicles, and second-order effects associated with larger new vehicle sales operations (e.g., per-unit advertising costs, increased customer traffic, greater selection), would directionally increase the magnitude of correlation between a franchised dealership's new vehicle sales and franchise-related used vehicle sales. The stop-sale order reduced Franchised Dealers' access to other used TDI vehicles that could have been resold profitably, such as off-lease vehicles and factory auctions. The model does not consider losses of used vehicle sales from other sources.

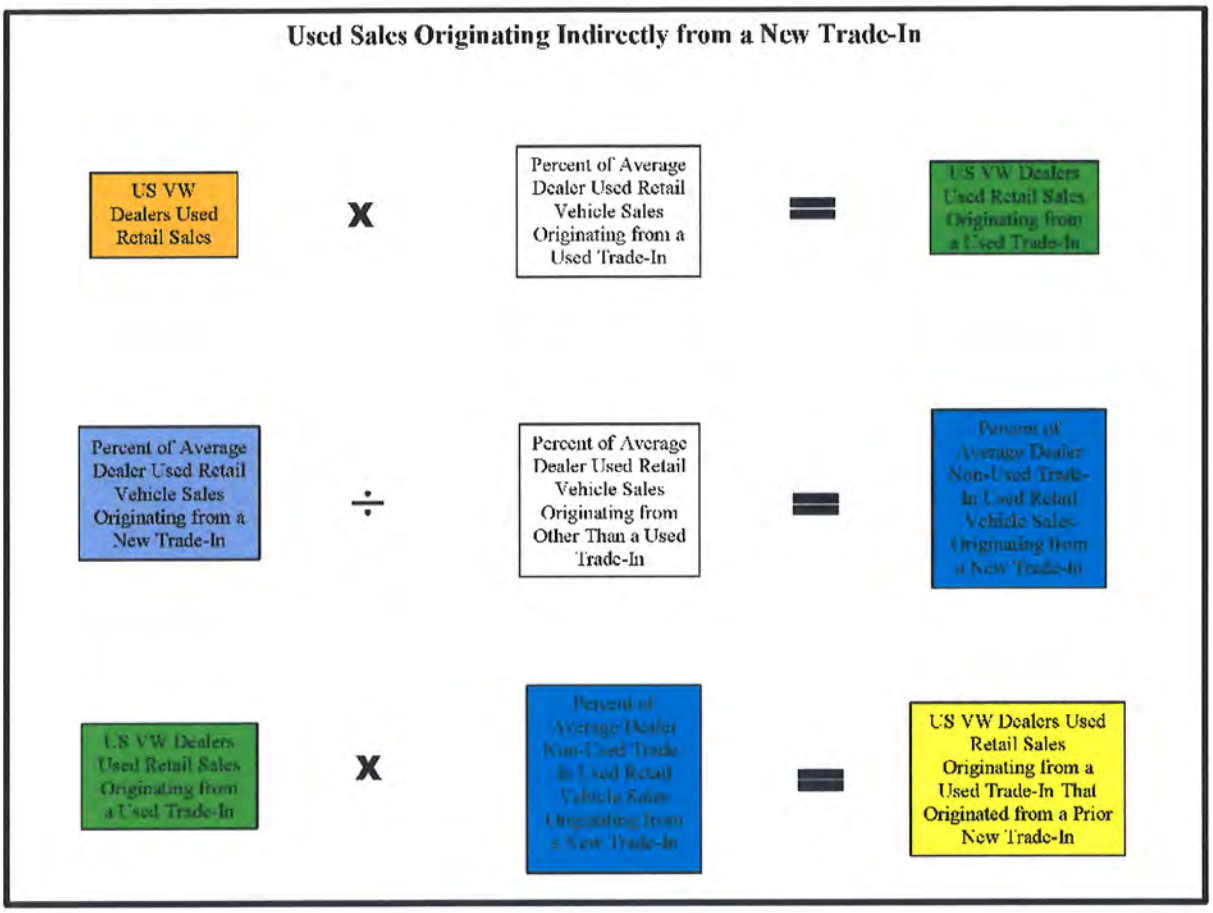
A three-part illustration of the relationship between new vehicle sales and used retail vehicle sales follows. The data are from Volkswagen's composite financial statements and from NADA analysis of franchised dealerships' used vehicle sales.[41] The illustration tracks the sources of used retail vehicle sales (trade-in, other) in order to calculate the propensity of new vehicle sales to generate used retail vehicle sales. I adjust the NADA figures to account for small differences between the average US franchised dealership and the average Volkswagen dealership.

[41]NADA Data Annual Financial Profile of America's Franchises New-car Dealerships, 2015.

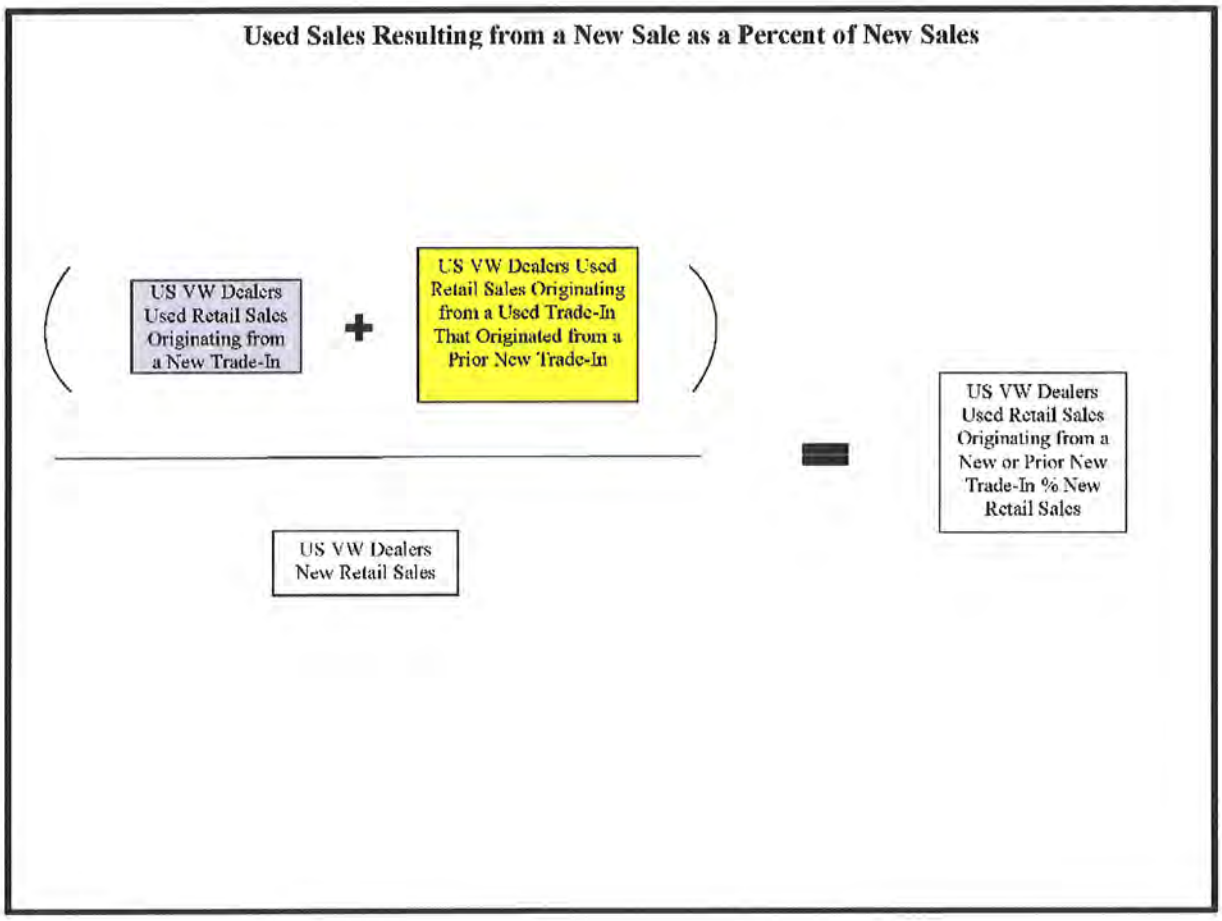
E.1. USED VEHICLE SALES: DIRECT CONTRIBUTION OF NEW VEHICLE SALES:



E.2. USED VEHICLE SALES: INDIRECT CONTRIBUTION OF NEW VEHICLE SALES:



E.3. USED VEHICLE SALES: TOTAL CONTRIBUTION OF NEW VEHICLE SALES:



Consistent with the derivation of lost new vehicle profits, the model estimates lost used vehicle profits based on the product of lost used vehicle sales and the actual profit contributions retained by Plaintiffs during the base period. Inherently, because the lost used vehicle profits are calculated as a percent of the lost new vehicle sales after incorporating the Returning Customer Offset, the offset flows through to the used vehicle calculation. Consequently, lost used vehicle department profits stemming from goodwill as defined by the Court are excluded from the result. Likewise, the Competitive Registration Factor, which modifies the estimate of lost new vehicle sales, flows through to the lost used vehicle sales result. In other words, the model's calculation of lost profits from lost used vehicle sales has already been adjusted to account for: (1) non-recoverable goodwill; and (2) general changes to the vehicle sales market.

F. FIXED OPERATIONS (PARTS AND SERVICE)

Fixed operations are a dealership's parts and service departments. The model estimates lost fixed operations profit both from lost new vehicle sales and, as described below, from the buyback, beginning with revenue, using a conventional method that analysts for dealerships and manufacturers use regularly

in the retail automotive industry. This method estimates the amount of fixed operations business based upon the number of in-use vehicles within the market. Many entities, including industry data sources like IHS (formerly The Polk Company), Ward's, and manufacturers like Volkswagen, refer to in-use vehicles as Units in Operation (UIO) or Vehicles in Operation (VIO). I will refer to these in-use vehicles by the common shorthand term, "UIOs." In this context UIOs refer to active TDI vehicles in the market.

The practice of evaluating fixed operations activity in relation to UIOs in the market is commonplace. Several manufacturers tether fixed operations sales[42] to the number of UIOs in a dealer's market. For example, Volkswagen's "Volkswagen 360" report shows dealer parts sales per UIO and shows that dealer's rank against the local area as well as regional and national dealer body.[43] Ford has used a dealer's low parts and services sales per UIO as a cause for termination. Some states' motor vehicle codes and statutes consider, when evaluating challenges to manufacturers' attempts to terminate dealerships, dealerships' sales volumes in relation to their markets, which manufacturers may assess, in part, based on dealership parts and service sales relative to UIOs in their markets. Also, I recently testified to the use of this metric in the Court of Federal Claims in a matter related to the termination of Chrysler franchises,[44] and I have testified about this metric in a number of state and federal courts and tribunals and regularly use it in consulting matters. I used this metric in my analysis of Volkswagen's settlement of its liability in this case, which was cited by the Court in the approval of the settlement by Volkswagen. Dealership financial statements do not segregate fixed operations activity by vehicle model (TDI Jetta, gas Touareg, etc.). Although it is common to employ aggregate UIOs for this purpose, Plaintiffs have requested from Volkswagen documents that would assess whether TDI vehicles require fixed operations support in approximately the same proportion of other Volkswagen vehicles. Whatever answer these documents provide can easily be factored into the model.

It is important to note that calculating economic damages on a class-wide basis more accurately captures the relationship between new vehicle sales and support for UIOs. This is because fixed operations income from UIOs looks at the entire market of UIOs. By way of example, a consumer may buy a new vehicle and subsequently move, or may prefer another Volkswagen dealership for service, or may simply work closer to a Volkswagen dealership than the dealership from which the vehicle was purchased. In each of these scenarios, a Franchised Dealer derives value from the sale of a new vehicle even if a different Franchised Dealer originally sold the vehicle. An individualized damage calculation would either: (1) be less accurate than the Class-wide calculation because it would not account for fixed operations profit shift by the seller not being the servicer; or (2) require the daunting and difficult exercise of tracing vehicles through their service encounters over time. The class-wide calculation improves both accuracy and efficiency because it does not matter which Volkswagen dealer does the warranty and service work associated with the vehicle sale, the Franchised Dealer class as a whole has lost the revenue and profits associated with the TDI sale that was not, and never will be, effectuated.

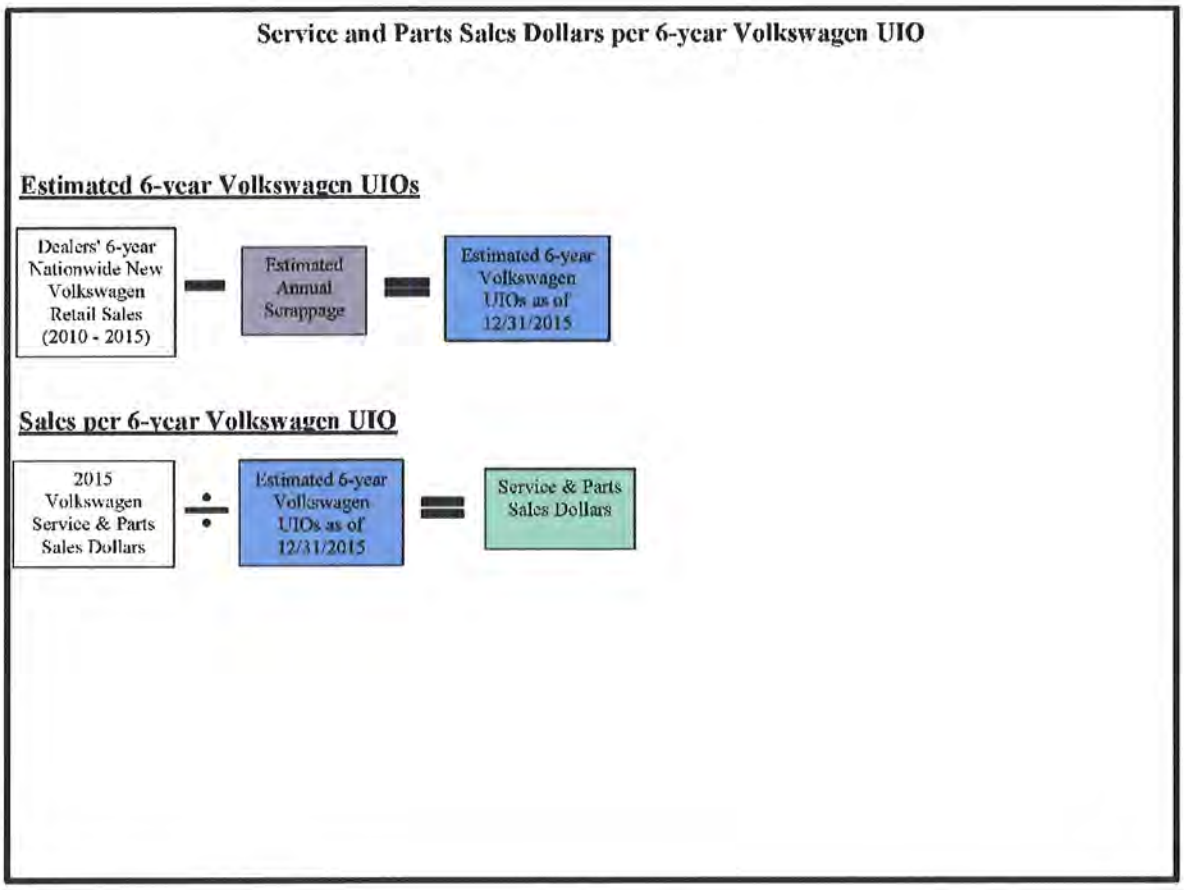
The table below illustrates the estimation of lost fixed operations sales from lost new vehicle sales. Lost new vehicle sales deplete the UIO base for an assumed six years. Recall that TDI models were newly-introduced for the 2009 MY and were discontinued in 2015. By using a six-year sales history as the UIO base, this considers sales from a time period during the product's first model year until the stop-

[42] In general, manufacturers directly evaluate parts sales per UIO, since authorized parts are specifically sold by the manufacturer to dealerships and resold to customers. "Retention" generally describes dealerships' propensity to generate service encounters with customers in their markets.
[43] The document Bates numbered BOZZVW00005026 is an example of such a report.
[44] *In the United States Court of Federal Claims,* No. 10-647C, 11-100C, and 900C Consolidated.

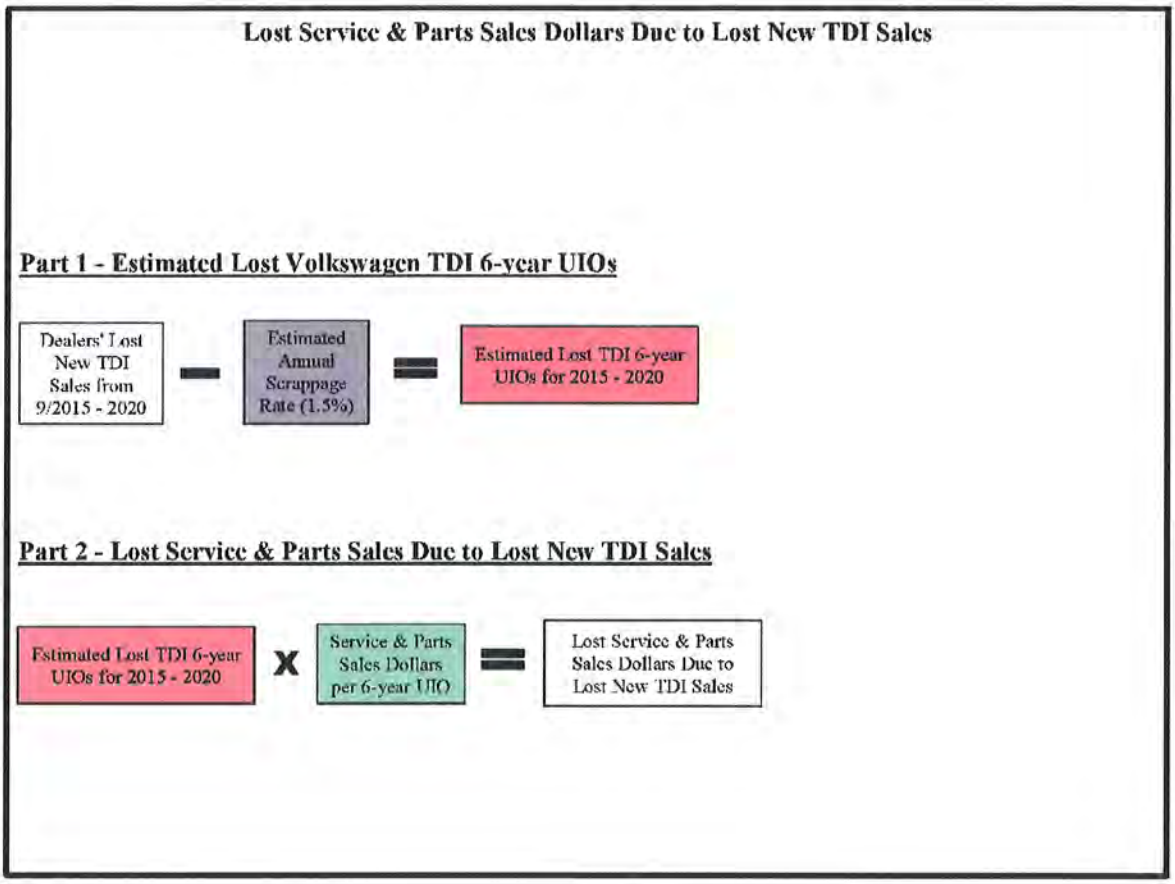
sale order. The use of a different base period for UIOs would directly adjust algebraically within the parameters of the model.

Thereafter, it is possible to tabulate the depletion of the UIO base by comparison to the new vehicle sales lost in the current and prior five years. To determine aggregate lost fixed operation sales, the model applies the Plaintiffs' actual fixed operations sales per six-year UIO in 2015 to the lost UIOs for that year. As with used vehicle sales described above, the lost fixed operations model inherently controls for the Returning Customer (goodwill) Offset and the Competitive Registration Adjustment because those factors are included in the new vehicle sales figure, from which the fixed operations figures are derived.

Part 1: Service and Parts Revenue per 6-year Volkswagen UIO



Part 2: Lost Service and Parts Revenue Due to Lost New TDI Sales

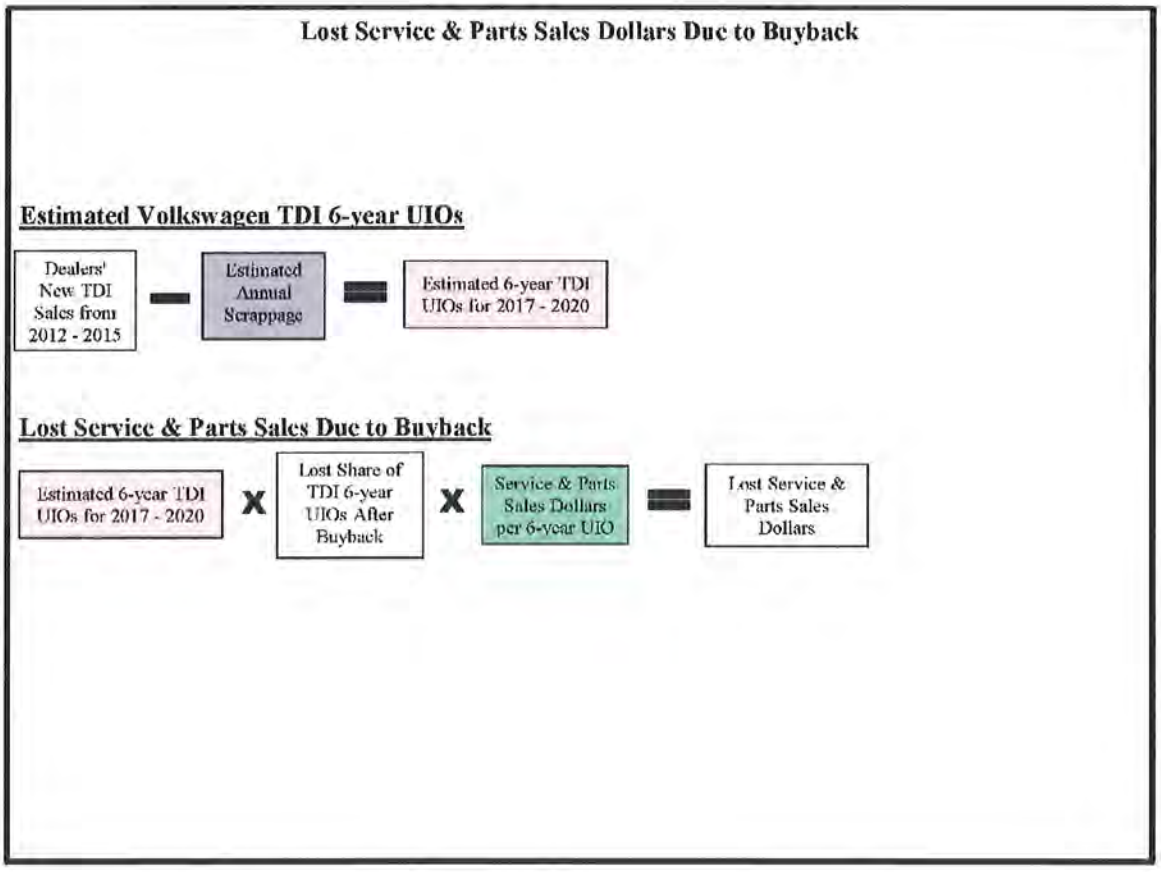


G. BUYBACK DAMAGES

The buyback eliminated active UIOs from the market, depleting the fixed operations potential of in-use TDI vehicles. As described in the prior section, the model applies a six-year active life in terms of TDI vehicles' value to the fixed operations of Plaintiffs. The buyback, with an estimated midpoint of March 2017, withdrew vehicles from the UIO base prior to the end of their active UIO duration. The buyback damages model calculates the portion of the active UIO duration that the buyback terminated and estimates the lost fixed operations revenue that would have occurred during that time period. By way of example, if an active UIO generates $1,000 per year in fixed operations revenue, and the buyback removes a vehicle that is 4.5 years old, the lost fixed operations revenue would be (6-4.5) * $1,000 or $1,500. Applying the profit contribution of the average US Volkswagen dealer, as described in the prior slide, converts this lost revenue to lost fixed operations profit.

The source for the buyback statistics is the report of the Claims Administrator in the consumer settlement, which reports the status of vehicle buybacks.[45] Although the Touareg buyback occurred in connection with the 3.0-liter settlement, which was later than the 2.0-liter settlement, Touaregs made up a small percentage of total buyback vehicles, thereby having little influence on the midpoint of the buyback. Conservatively, the model assumes that customers continued their existing fixed operations relationships with the dealership until the point at which they set their appointment to engage in the buyback process. The model is conservative because consumers' incentive to spend money on vehicles that they knew they would not retain, and on which they knew the sales price would be fixed,[46] would have been reduced or eliminated once they knew that the buyback was going to occur.

Part 3: Lost Service and Parts Revenue Due to Buyback

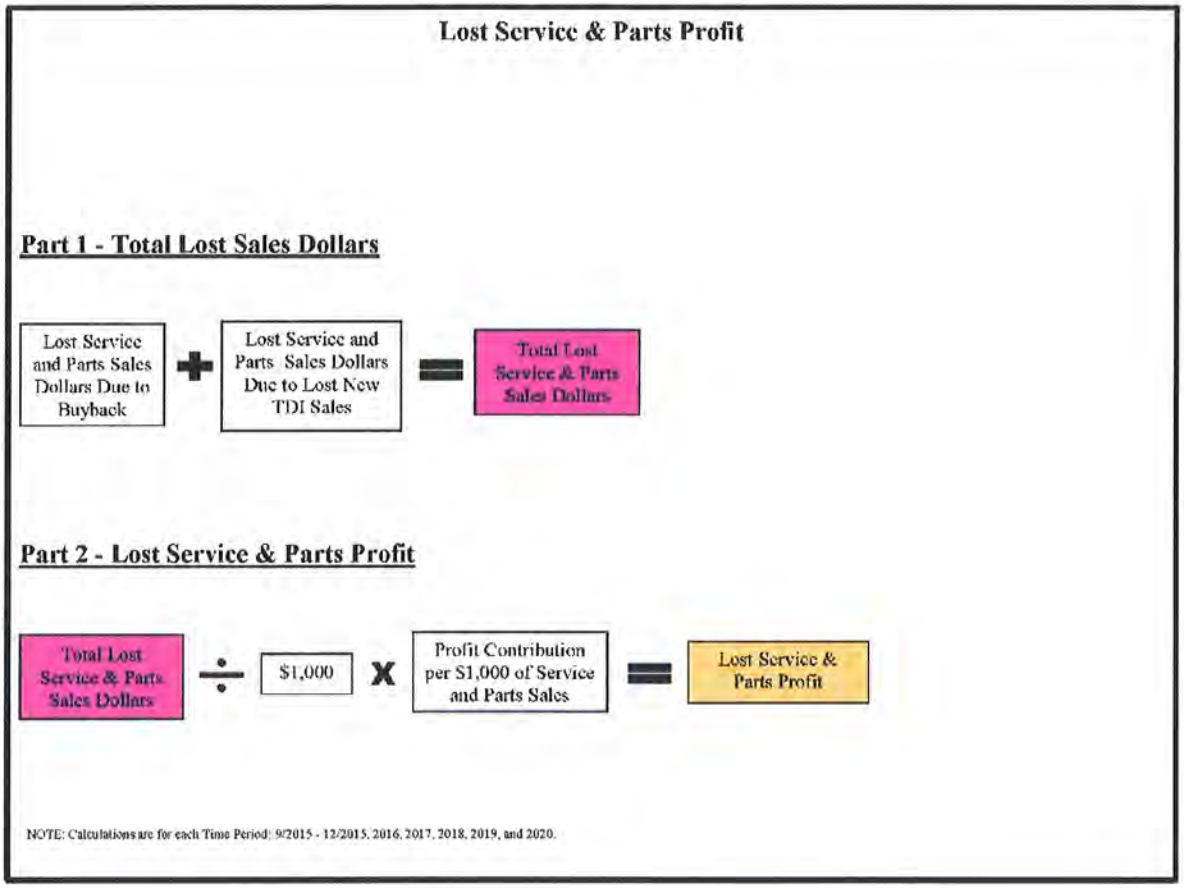


[45] *Report of Independent Claims Supervisor on Volkswagen's Progress and Compliance related to 2.0 Liter Resolution Agreements Entered October 25, 2016*, November 26, 2018 and *Report of Independent Claims Supervisor on Volkswagen's Progress and Compliance related to 3.0 Liter Resolution Agreements Entered May 17, 2017*, December 13, 2018.

[46] The terms of the consumer settlement set the buyback price for every vehicle at its dealer trade-in value as of September 2015. Thus, consumers had zero incentive to maintain their cars prior to submitting them for buyback unless the repair was to keep the vehicle operational and safe until the buyback.

Once I have used the above method to determine the total lost service and parts sales dollars for the class, I apply the average US Volkswagen dealer profit contribution to determine lost service and parts profit for the class. The profit contribution is derived from Volkswagen composite financial statements, aggregated across each Volkswagen-defined region in the US. The below table illustrates the calculation.

Part 4: Total Lost Service and Parts Profit



H. TIME VALUE OF MONEY

It is necessary to adjust certain elements of the damage model for risk, uncertainty, and the time value of money. However, the components of the model include both known factors and estimated factors. In other words, the model includes both *ex ante* and *ex post* elements. New TDI vehicle sales ceased in 2015, making some elements of the sales forecasts subject to discounting. However, the model applies known adjustments through the Competitive Registration Factor, which are based upon information currently available. It is, therefore, appropriate to apply discount rates that relate properly to the facts that they modify.

a) The performance of TDI vehicles within their market are subject to forecast;

b) The Competitive Registration changes from the base period are known and incorporated in the model;
c) Buyback numbers are known;

The model applies a discount rate of half of the equity-based CAPM rate **(Tab 12)** to new vehicle sales forecasts. Since the TDI franchise ended with the stop-sale, the risks associated with those forecasts have not been realized over time. Rational entities require certain returns to assume particular risks, and the risks associated with the Buyback and Competitive Registration changes are already fully measured. Only the risks associated with the TDI forecasts remain unrealized, and indeed cannot be realized since the franchise is terminated. This calls for a discount rate to be applied, but it is not prudent to apply the full discount rate given that some of the risks are realized. During the actual time of TDI sales, the variance in Competitive Registrations, relative to the average volume over the entire time period, was greater than the variance in the TDI's market share within the Competitive Registrations. Since the model treats Competitive Registrations as known, it is conservative to reduce the CAPM discount rate by half. This adjustment equally weights the risks of the TDIs' collective market share and of the size of the relevant retail automotive market.

I. MITIGATION

I.1. MITIGATION OF LOST NEW VEHICLE SALES

The model is designed to take into account mitigation in the event that the evidence credibly supports its existence. Since the model is structured based upon the profit-generating components of franchised dealerships, mitigation that did occur would flow to dealerships through their departmental profit-generating capacity in a manner that the model can incorporate.

The table on the following page illustrates the manner in which mitigating new vehicle sales could occur. If Volkswagen accelerated the design and/or release of new models or model redesigns for reasons directly attributable to the loss of the TDI vehicles, these efforts could serve as offsets to lost new vehicle sales. Furthermore, if the loss of TDI vehicles freed production constraints, allowing Volkswagen to produce for the United States market vehicles that it could not otherwise have produced, this could potentially create mitigating sales.

Plaintiffs could also mitigate lost sales through certain natural offsets, through normal operation of their Volkswagen dealerships. By way of example, consumers who would have purchased new TDI vehicles but purchased other Volkswagen models instead may soften the impact of the loss of TDI products. However, this potential source of mitigation applies only to non-returning Volkswagen customers. Returning Volkswagen customers who migrate from TDI vehicles to other Volkswagen vehicles represent goodwill sales, the consequences of which (whether a profit loss or profit gain) are excluded from the model.

Potential Sources of Mitigating New Sales

1. **Accelerated/Unanticipated New Models**
2. **Accelerated/Unanticipated Redesigned Models**
3. **Increased Production Capacity?**
4. **Natural Migration to Non-TDI Models?**

One way to estimate the degree to which Plaintiffs offset their lost TDI vehicle sales is through the concept of natural market share. Most manufacturers, including Volkswagen, develop sales expectations for markets and dealerships based upon a model that assumes that consumers choose between vehicles within a single segment or group of segments (Competitive Registrations). Under this model, a consumer who would have chosen a TDI vehicle model but could not due to the stop-sale and termination of all TDI models then chooses among competitors based upon their market shares within the segment, excluding the TDI vehicles. By way of example, if a certain segment had 10 entrants, each with a 10% market share, a consumer who cannot buy the vehicle of his or her choice, then selects among the other entrants, each of which has a 10/90 or 11.1% share of the remaining market. This method provides a reasonable estimate of the offset to lost TDI vehicle sales that Plaintiffs experience through migration to non-TDI vehicle models. Furthermore, this method can address the goodwill exclusion, as the likely higher propensity of would-be TDI vehicle consumers to select Volkswagen products reflects a preference for the Volkswagen brand, which is likely a benefit of goodwill.

Plaintiffs have requested from Volkswagen documents concerning product release and remodel cycles. My review of trade literature has shown no evidence of early model releases or redesigns in response to the TDI vehicle line termination. But if information from Volkswagen suggest otherwise, any mitigating effect of changes to the release and remodel cycles can be incorporated into the model.

Increases in non-TDI sales by Volkswagen do not present a credible case for mitigation of lost TDI vehicle sales. The context of Volkswagen sales prior to the stop-sale orders is relevant here. Volkswagen was seven years into a commitment to increase its US sales to 800,000 units by the year 2018. It was well short of that goal. Rather, sales had declined in 2015. Despite falling off its own growth trajectory, Volkswagen re-committed to the 800,000-unit sales figure but acknowledged that achieving that goal by the 2018 date would be very difficult. Nonetheless, Volkswagen was in a position that required extensive sales growth to approach its own targets. It is likely that efforts to enhance its product lineup and sales volume were already underway. **See Tab 17.**

Since the stop-sale order, Volkswagen has reaffirmed its commitment to 800,000 new vehicle sales in the United States. However, this is based upon a target date of the year 2025. Even using 2016, the year after the stop-sale orders, as a baseline for this forecast, Volkswagen's sales trend in the US has been below the growth rate that would be necessary to achieve its growth target. Thus, neither accelerated product development, nor growth trends, supports a contention of broader mitigation of lost TDI vehicle sales by Volkswagen. **See Tab 18.**

Other evidence supports higher forecasts of TDI vehicle sales than baseline levels. In 2017, Volkswagen followed through on its (pre-scandal) scheduled replacement of the Touareg vehicle with the

popular Atlas model. Sales of the Atlas have significantly increased over the levels of its predecessor. However, Volkswagen had planned to release a TDI version of the Atlas.[47] The Alleged Misconduct deprived the Plaintiffs of the TDI growth potential associated with the new Atlas release. As such, the release of the Atlas itself was also adversely affected by the cessation of the TDI franchise.

Since the stop-sale orders, Ford and General Motors have also announced plans to exit most of the sedan markets.[48] This change inherently increases Volkswagen's share of the sedan market. The TDI sedans would have benefitted from increased relative presence in the sedan market through a decline in inter-brand competition.

The data available to me at this time show substantial unmitigated loss to the Plaintiffs. Using an assumed mitigation scenario that is very favorable to the Defendant illustrates this point. In this scenario, Volkswagen would, despite earlier failures to do so, reach its 800,000-unit US sales goal by 2025. Since Volkswagen offered this objective recently, after the stop-sale, I assume that this sales forecast presumes that the US sales growth necessary to hit the target implicitly must replace all TDI sales. Therefore, I assume for the purpose of this model that Volkswagen's sales growth replaces TDI sales with other sales at a growing rate until fully doing so in 2025. The model can accommodate this aggressive mitigation assumption, although not evidenced. The outcome of the analysis, taking into account another adjustment described below, provides perspective on the relative degree of mitigated and unmitigated economic harm that is apparent at this time.

Tab 15 calculates the model described up to this point and includes the mitigation assumption described above, along with other conservative assumptions. It includes the goodwill and competitive registration adjustments, and an assumed 6.39% natural market share mitigation factor, which is higher than the actual natural market share mitigation factor that existed prior to the stop-sale, and equal to the highest natural market share observed in any segment in which TDI models competed. After 2018, assumed mitigating growth in other models increases linearly until no lost new TDI sales remain in 2025. It makes no adjustment for Ford's and GM's withdrawal from the car market. Finally, it applies the full CAPM discount rate to subsequent years' profits lost to the stop-sale order.[49] The present value of lost profits associated with the stop-sale and TDI cessation as a result of the Alleged Misconduct is approximately $692 million. The buyback resulting from the Alleged Misconduct has present value damages of over $150 million. While the return to the market of certain bought-back TDI vehicles does provide some mitigation to lost profits from fixed operations in addition to the new TDI sales mitigation, the foreseeable value of those categories of potential mitigation is quite small relative to the clearly unmitigated damages.

I.2. MITIGATION THROUGH USED VEHICLE SALES

Recent registration data show the return of bought-back TDI vehicles to the used vehicle market. Plaintiffs have requested documents from Volkswagen sufficient to show the number of repurchased

[47] Viknesh Vijayenthiran, "2018 Volkswagen Atlas: 3-row SUV made in US," *Motorauthority.com* (November 18, 2016): https://www.motorauthority.com/news/1105741_2018-volkswagen-atlas-3-row-suv-made-in-us.
[48] See Tab 19.
[49] The use of the full CAPM is intentionally conservative, in light of the known changes to the Competitive Registrations in the market. The use of the full CAPM for illustrative purposes is in contrast to the treatment of the assumed mitigation of lost TDI sales. Manufacturers in general, and VW in particular, often fail to reach forward-looking sales targets. The particularly aggressive plan to replace TDI sales in total, possibly through a migration to electric vehicles, would be subject to significant discounting for the risk of achieving the forecast.

vehicles that have been reintroduced to the market and Volkswagen's planned future reintroduction of these vehicles. The re-entry of repurchased TDI vehicles to the used vehicle market presents the possibility of mitigation of lost profits suffered by Plaintiffs if the re-entry occurs through a sale at Plaintiffs' dealerships when they otherwise would have been sold through different channels. For example, if Volkswagen offers its dealers the opportunity to buy repurchased TDI vehicles, repair them, then sell them as used or Certified-Pre-Owned vehicles, these sales present a mitigating profit opportunity for dealers.

Although document discovery is outstanding on this topic, my staff and I have analyzed the best available source for used vehicle sales and registrations. Data vendor IHS cooperates with state agencies to acquire information about vehicle registrations, including in some cases selling dealership identity. My staff have reviewed data from states that both have selling dealer information available for used vehicle registrations and historically had high new TDI vehicle sales. The purpose of this exacting review was to evaluate changes in used TDI vehicle sales over time by Volkswagen franchised dealerships. The results of this analysis appear in **Tab 21**.

While used TDI vehicle sales by franchised dealerships have increased substantially since late 2018, this follows a long dip versus historical levels following the stop-sale order. Furthermore, Volkswagen dealerships sell only approximately half of the recent used TDI vehicle sales, with the balance of those vehicles selling through other channels. Recall that the model does not count lost used TDI vehicle sales beyond those directly related to new TDI sales. Thus, incremental profit associated with recent used TDI sales does not have a lost profit figure to offset. Although the model can accommodate evidence of net mitigation experienced by dealerships in the sale of repurchased used TDI vehicles, available data suggest that dealers will experience modest net mitigation from these sales.

The sales of repurchased TDI vehicles can mitigate dealership losses in two ways, both of which the model can accommodate. The first is through incremental service revenue associated with emissions repairs on the used TDI vehicles. The calculation of mitigation from this source would follow a straightforward multiplication as follows, assuming that Volkswagen compensates dealerships for these repairs:

Vehicles Returned to Service with Emissions Repairs * Dealer Reimbursement for Emissions Repair * Profit Contribution on Fixed Operations Sales.

The second potential source of mitigation occurs if the repurchased TDI vehicles re-enter the active UIO base. The model can accommodate this adjustment. The most conservative adjustment would be to assume that the vehicles did not age during their idle period. In other words, this adjustment would assume that the vehicles lost none of their active service lives while they were idled following their repurchase from consumers. The opposite calculation would be to assume that the vehicles' service lives progressed normally while idled. Either assumption is applicable in the lost profit model. The outstanding necessary input is information from Volkswagen regarding the expected volume of re-entry of the repurchased TDI vehicles.

J. OFFSETS

The model can readily accommodate offsets to economic damages suffered by the Franchised Dealer Class. I consider offsets to be direct payments that reduce Franchised Dealers' economic harm, such as dealer support payments that Volkswagen paid in the months immediately following the issuance of the stop-sale orders and the settlement payments that Volkswagen made and is making to Franchised

Dealers in exchange for its dismissal from this lawsuit. With the amount and timing of offsets, it is possible to consider the effect of offsets on the overall calculations of the model simply by adjusting any offset to the appropriate time value.

Apart from cash payments to dealers, either before or in anticipation of the Volkswagen dealer settlement, I have reviewed certain programs that Volkswagen offered to Franchised Dealers to assist in managing the fallout of the emissions scandal. Most appear to be direct compensation for costs or waiver of costs, such as the costs of holding unsaleable vehicles in inventory. As a result, these non-cash programs would generally only offset new costs associated with the emissions scandal, but not the lost profits that the model derives. One particular program, however, offers at least the possibility of offset to lost profits. This program is the VIP program, through which Volkswagen paid dealerships a fixed rebate in cash per vehicle sold.

Volkswagen announced on September 25, 2015, that it would pay "tier III" payouts for its Volume-Based Incentive Program (VIP) to all dealers. As part of the settlement with dealerships, Volkswagen agreed to continue to pay these incentive payments to dealers for 12 months after the earlier of the first settlement payment or the settlement opt-out date.[50]

Plaintiffs have requested information on VIP payments to dealerships in order to evaluate the degree to which the temporary program change increased gross payments to dealerships. Those requests are pending. However, in spite of likely higher payments, dealerships may have needed to modify their behaviors in one of several ways in order to remain competitive in the wake of the emissions scandal. For example, dealers might have increased spending on customer relations in order to maintain customer satisfaction with the dealership and Volkswagen. Thus, increased VIP payment may have simply offset additional costs.

Even if dealerships did not incur material increased customer relations costs during the enhanced VIP program period, it is highly likely that dealerships traded away much of the gross revenue. Rational firms price their goods to the point that price at marginal cost equals marginal revenue. Given this basic profit-maximizing condition in economics, the simple model below illustrates why dealers will trade away their margin on transactions in exchange for the possibility of obtaining benefit from an incentive payment. Volkswagen's commitment to pay these incentives to all dealers increases the probability of attaining incentives in the below formula to a certainty, and consequently lowers the price at which dealers are willing to sell vehicles.

$$R_i = R_n - UE[p(i)] * I$$

R_i = Reservation price with incentive environment;
R_n = Reservation price with a no-incentive environment;
UE = Risk-adjusted expected value;
p(i) = Probability of attaining incentives;
I = Incentive amount.

This willingness to sell at a lower price given the certainty of receiving incentive payments is supported by **Tab 23.** Dealership gross margins on comparable vehicles declined from the base period to the period following the stop-sale orders. This suggests that dealerships either traded away much of the increased gross incentive revenue or experienced lower margins overall, such that the increased VIP

[50] *Order Granting Final Approval of Volkswagen Branded Franchise Dealer Class Action Settlement Agreement and Release*, p.5.

payments did not improve dealerships' transactional profitability in the time period following the stop-sale order. While the VIP payments present the possibility of offset, the evidence does not indicate meaningful support for the proposition that these payments offset harm from the emissions scandal on a net basis. In any event, if data and information received in discovery concerning the post-stop-sale change in VIP payments shows it resulted in incremental profits per sale to dealers, this can be incorporated into the class-wide damages model.

10. SUMMARY:

The proposed model relies upon techniques and estimation methods used by analysts and decision-makers in the retail automotive industry. The use of departmental profit structures follows the format in which manufacturers and dealerships communicate dealership profitability. The profit contribution model is accepted in economics. The use of a competitive registration adjustment factor is commonplace within the retail automotive industry, as is the concept of modeling fixed operations opportunity based upon active UIOs. I have personally testified to models relying on these elements in state and federal courts, arbitration, alternative dispute resolution processes, and the Court of Federal Claims.

The model reliably estimates lost profit on a class wide basis from the Alleged Misconduct, which closely replicates the effect of the termination or discontinuation of the TDI vehicle portion of Plaintiffs' franchises. The model can accommodate adjustments for changing market conditions, mitigation, alternate assumptions about sales forecasts, and offsets.

The following describes the contents of the tabs to this report:

SECTION 1 - TABS 1-2: QUALIFICATIONS AND EXPERIENCE

- Tab 1: Curriculum Vitae of Edward M. Stockton
- Tab 2: Testimony in Previous Four Years

SECTION 2 - TABS 3-8: DAMAGE CALCULATIONS

- Tabs 3 - 7: Illustration of Damages
- Tab 8: Illustration of Percentage of Used Sales from Trade-in on a New Sale

SECTION 3 - TABS 9-15: DAMAGES

- Tab 9: Adjustment for Change in Registrations/Natural Market Share
- Tab 10: Used Retail Sales Originating from New Trade-in/New and Used Retail Sales
- Tab 11: VW Service + Parts and Accessories Sales per 6-year UIO
- Tab 12: Present Value Discount Factor
- Tab 13: Inflation Adjustment Factor
- Tab 14: Profit Contributions
- Tab 15: Damages

SECTION 4 - TABS 16-24: POTENTIAL SOURCES OF MITIGATION

- Tab 16: Potential Mitigation of New Sales
- Tab 17: Timeline of US Volkswagen Sales and Models
- Tab 18: Actual and Projected Volkswagen Sales
- Tab 19: Articles Regarding Ford and GM Exit from Car Business
- Tabs 20 - 21: Potential Mitigation of Lost Used TDI Sales
- Tab 22: Illustration of UIO Life Remaining for Buyback Vehicles
- Tab 23: Gross Profit per New TDI and Non-TDI vehicle
- Tab 24: Data/Documents Relied Upon

SECTION 5 - APPENDIX

11. COMPENSATION:

For my time spent on this matter, my employer currently charges $445 per hour. Travel time is billed at one-half of the regular rate. Testimony time is billed at $592 per hour. Time spent by staff members is billed at rates between $60 and $595 per hour. Neither my compensation nor that of my employer depends upon the outcome of this case.

12. DATA/DOCUMENTS RELIED UPON:

Reliance materials include those specifically included in the contents of this report, those materials cited in the narrative portion of the report, and those identified in the "DATA" lines of exhibits to the report. I enclose a list of reliance materials in Tab 24.

Executed this 14th day of June 2019

Edward M. Stockton

Edward M. Stockton

EDWARD M. STOCKTON

EDUCATION

University of Arizona, Tucson, AZ
M.S., Agriculture and Resource Economics (Applied Econometrics), 2010.
Western Michigan University, Kalamazoo, MI
B.A., Economics, 1998

POSITIONS

The Fontana Group, Inc., Tucson, Arizona
Vice President Economics Services: 2012 - present
Director of Economics Services: 2011 - 2012
Case Manager: 2005 - 2011
Senior Analyst: 2000 - 2005
Analyst: 1998 - 1999
Old Ina Corporation Tucson, AZ
Supervisor, Analyst, Manager: 1995 - 1998

RESEARCH AND CONSULTING EXPERIENCE

Mr. Stockton manages the analysis of documents, data and markets in the retail automobile industry and other industries. He has provided consultation to automobile dealers and attorneys in numerous areas including:

- Retail automobile franchising, economics and marketing
- Allocation of new vehicles during shortages
- Franchise terminations
- Franchise additions and relocations
- Analysis of manufacturer customer satisfaction measurement programs
- Customer satisfaction measurement
- Sales and profitability forecasts
- Financial analysis
- Statistical and econometric analyses
- Consumer credit
- Economic theory

REPRESENTATIVE CLIENT ASSIGNMENTS

Colonial Chevrolet Co., Inc., et al.; Alley's of Kingsport, Inc., et al.; and Union Dodge, Inc., et al. v. The United States, Washington, DC, 2011-.
Provided trial testimony.

Barber Group, Inc., d/b/a Barber Honda v. American Honda Motor Co., Inc., Galpinsfield Automotive, LLC, Intervenor. Bakersfield, CA, 2018-.
Provided deposition testimony.

Association of Equipment Manufacturers, AGCO Corporation, CNH Industrial America LLC, Deere & Company, and Kubota Tractor Corporation, v. the Hon. Doug Burgum, Governor of the State of North Dakota, in His Official Capacity, and the Hon. Wayne Stenehjem, Attorney General of the State of North Dakota, in His Official Capacity, and North Dakota Implement Dealers Association, Intervenor-Defendant, Bismarck, ND, 2018-.
Provided deposition testimony.

Napleton's Arlington Heights Motors, Inc. f/k/a Napleton's Palatine Motors, Inc. d/b/a Napleton's Arlington Heights Chrysler Dodge Jeep RAM, an Illinois Corporation; et. al, v FCA US LLC, Chicago, IL, 2017-.
Provided deposition and hearing testimony.

Star Houston, Inc. d/b/a Star Motor Cars v. Volvo Cars of North America, LLC, Houston, TX, 2017-.
Provided deposition and hearing testimony.

Sioux City Truck Sales, Inc. v. Peterbilt Motors Company, Sioux City, IA, 2017-.
Provided deposition and hearing testimony.

Capitol Buick GMC, LLC v. General Motors LLC, Baltimore, MD, 2017-.
Provided deposition and hearing testimony.

Crown Chrysler Jeep, Inc. d/b/a Crown Kia v. Kia Motors America, Columbus, OH, 2017-
Provided deposition and hearing testimony.

Folsom Chevrolet, Inc. dba Folsom Chevrolet v. General Motors, LLC, Folsom, CA, 2017-.
Provided deposition and hearing testimony.

Sunnyvale Automotive Inc., dba Sunnyvale Ford Lincoln v. Ford Motor Company, Sunnyvale, CA, 2017-.
Provided deposition testimony.

Omar Vargas, Robert Bertone, Michelle Harris, and Sharon Heberling, individually and on behalf of a class of similarly situated individuals v. Ford Motor Company, Los Angeles, CA, 2017-.

Charles Johnson, et al. individually and on behalf of all others similarly situated v. Ford Motor Company, Huntington, WV, 2017-.
Provided deposition testimony.

Shawn Panacci v. Volkswagen Aktiengesellschaft, Volkswagen Group Canada, Inc., Audi Aktiengesellschaft, VW Credit Canada, Inc. and Audi Canada, Toronto, Ontario, Canada, 2017-.

Rebecca Romeo and Joe Romeo v. Ford Motor Company and Ford Motor Company Canada, Limited, Toronto, Ontario, Canada, 2017-.
Provided cross-examination testimony.

Duncan McDonald v. Samsung Electronics Canada, Inc. Toronto, Ontario, Canada, 2017-.
Provided cross-examination testimony.

The Estate of Richard C. Poe, Richard C. Poe II v. Paul O Sergent, Jr., et al., El Paso, TX, 2017-
Provided deposition testimony.

Star Houston, Inc. d/b/a Star Motor Cars v. VCWH. LLC d/b/a Volvo Cars West Houston and Volvo Cars of North America, LLC, Houston, TX, 2017-.
Provided deposition testimony.

Option Consommateurs et Francois GrondinPersonne Désignée C. Volkswagen Group Canada Inc. et al.(2L), Montreal, Quebec, 2017-.

Option Consommateurs et Francois GrondinPersonne Désignée C. Volkswagen Group Canada Inc. et al. (3L), Montreal, Quebec, 2017-.

John M. McIntosh v. Takata Corporation, TK Holdings, Toyota Motor Corporation, Toyota Motor Manufacturing, Canada Inc., and Toyota Motor Manufacturing Indiana, Inc., Toronto, Ontario Canada, 2017-

Rick A. Des-Rosiers and Stephen Kominar v. Takata Corporation, TK Holdings, Honda Motor Co., LTD, Honda of America Manufacturing, Inc., and Honda Canada, Toronto, Ontario, Canada 2017-.

Yogesh Kalra v. Mercedes-Benz Canada Inc., Daimler AG, Mercedez-Benz USA LLC and Mercedes-Benz Financial Services Canada Corporation, Toronto, ON, Canada, 2017-.
Provided cross-examination (deposition) testimony.

Lake Forest Sports Cars, LTD v. Aston Martin Lagonda of North America, Inc., Chicago, IL, 2017.
Provided deposition testimony.

Shahriar Jabbari and Kaylee Heffelfinger on behalf of themselves and all others similarly situated v. Fargo Company and Wells Fargo Bank, N.A. San Francisco, CA, 2016-.

Matthew Robert Quenneville et al. v. Volkswagen Group Canada, Inc.,Volkswagen Aktiengesellschaft, Volkswagen Group of America, Inc., Audi Canada, Audi Aktiengesellschaft, Audi of America, Inc., Inc., and VW Credit Canada, Inc. (2L), Ontario, Canada, 2016-.

Matthew Robert Quenneville et al. v. Volkswagen Group Canada, Inc.,Volkswagen Aktiengesellschaft, Volkswagen Group of America, Inc., Audi Canada, Audi Aktiengesellschaft, Audi of America, Inc., Inc., and VW Credit Canada, Inc. (3L), Ontario, Canada, 2016-.

Fort Collins Nissan, Inc. d/b/a Tynan's Kia, v. Kia Motors America, Inc., Ft. Collins, CO, 2015-.
Provided deposition testimony.

In Re: Volkswagen "Clean Diesel" Marketing, Sales Practices and Products Liability Litigation, Napleton et al v. Volkswagen Group of America et al., No. 16-02086, 2015-.

Northwest Hills Chrysler Jeep, LLC; Gengras Chrysler Dodge Jeep, LLC; Crowley Jeep Dodge, Inc.; Papa's Dodge, Inc. v. FCA US, LLC and Mitchell Dodge, Inc., Canton, CT, 2015-2017.
Provided deposition testimony.

VMDT Partnership, LP, v. Thornbury Township, Delaware County, Pennsylvania, 2015-.
Provided hearing testimony.

John Deere Construction & Forestry Company v. Rudd Equipment Company, Inc., Houston, TX, 2015-2017.
Provided hearing testimony.

Ball Automotive Group d/b/a Ball Kia, v. Kia Motors America, Inc., San Diego, CA, 2015-2017.
Provided deposition testimony.

GB Auto Corporation d/b/a Frisco Kia, v. Corinth Automotive Plano, d/b/a Central Kia of Plano, Kia Motors America, Inc. Intervenor, Dallas, TX, 2015-2017.
Provided deposition testimony.

Walter Timmons Enterprises, Inc., d/b/a Timmons Subaru v. Subaru of America, Inc., Long Beach, CA, 2016-2017.

Motor Werks Partners, LP, v. General Motors, LLC, Chicago, IL, 2015-2017.
Provided deposition testimony.

Jeff Looper et al., v. FCA US LLC, f/k/a Chrysler Group, LLC, et al., California and Texas, 2015-2016.
Provided deposition testimony.

In Re: Volkswagen "Clean Diesel" Marketing, Sales Practices and Products Liability Litigation, San Francisco, CA*, 2015-2017.*

Dependable Dodge, Inc. v. Fiat Chrysler Automobiles, Inc., Canoga Park, CA, 2015-2017.
Provided deposition and hearing testimony.

Wayzata Nissan, LLC v. Nissan North America, Inc., et al., Wayzata, MN, 2015-2017.
Provided pre-filed trial testimony.

Glick Nissan, Inc. v. Nissan North America, Inc., Westborough, MA, 2015-2016.

Northwest Hills Chrysler Jeep, LLC; Gengras Chrysler Dodge Jeep, LLC; Crowley Jeep Dodge, Inc.; Papa's Dodge, Inc. v. FCA US, LLC and Mitchell Dodge, Inc., Canton, CT, 2015-2016.

Volvo Construction Equipment North America, LLC v. Clyde/West, Inc., Spokane, WA, 2015.

General Motors, LLC v. Hall Chevrolet LLC dba Hall Chevrolet, Virginia Beach, VA, 2015-2016.

Long Beach Motors, Inc. dba Long Beach Honda v American Honda Motor Co., Inc., Long Beach, CA, 2015.

Tom Matson Dodge Inc. v. FCA US LLC., Seattle, WA, 2015.

Ferrari of Atlanta, Atlanta, GA 2015.

Grossinger Autoplex, Inc. v. General Motors, LLC, Chicago, IL, 2015-2016.
Provided deposition and hearing testimony.

Mathew Enterprise, Inc. v. Chrysler Group LLC, San Jose, CA, 2015-2016.
Provided deposition and trial testimony.

Navistar v. New Baltimore Garage, Warrenton, VA, 2015-2016.
Provided hearing testimony.

Mathew Enterprise, Inc., a California Corporation, and Mathew Zaheri, an individual v. Chrysler Group, LLC, a Delaware Liability Company; Chrysler Group Realty Company, LLC, a Delaware Limited Liability Company, and DOES 1-40, San Jose, CA 2014-2015.
Provided trial and deposition testimony.

CNH America, LLC n/k/a CNH Industrial America, LLC v. Quinlan's Equipment, Inc., Racine, WI, 2014-2015.
Provided deposition testimony.

Grayson Hyundai, LLC and Twin City Hyundai, Inc., v. Hyundai Motor America, Knoxville, TN, 2014-2015.
Provided deposition testimony.

TrueCar, Inc. v. Sonic Automotive, Inc., and Sonic Divisional Operations, LLC, Los Angeles, CA, 2015-2016.
Provided deposition testimony.

TECC, Complaintant v. GM Respondent before the California New Motor Vehicle Board, Oakland, CA, 2014-15.

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Feldten, LLC, d/b/a Tennyson Chevrolet v. Keith Lang, Lang Auto Sales, Inc.,Gordon Chevrolet, Inc.,Stewart Management Group, Inc., Scott Rama, Susan Ianni, and Mike Meszaros, and Gordon Chevrolet, Inc.& Stewart Management Group, Inc. Detroit, MI, 2014-2016.

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Jim Hardman, Buick GMC, Gainsville, GA, 2014-2016.

Bates Nissan, Inc., v. Nissan North America Inc., Killeen, TX, October 2014-2017.
Provided deposition and hearing testimony.

Recovery Racing, LLC d/b/a Maserati of Fort Lauderdale v. Maserati North America, Inc., and Rick Case Weston, LLC, d/b/a Rick Case Maserati, Ft. Lauderdale, FL, 2014-.
Provided hearing testimony.

Sweeten Truck Center, L.C. v. Volvo Trucks North America, a Division of Volvo Group North America, LLC, Before the Texas Department of Motor Vehicles Motor Vehicle Division, Austin, TX, 2014-.
Provided deposition and hearing testimony.

Beck Chevrolet Co, Inc. v. General Motors LLC, New York, NY 2014-2016.
Provided trial testimony.

BSAG Inc., and Bob Stallings Nissan of Baytown, Inc. v. Baytown Nissan, Inc., Burklein Family Limited Partnership, Nissan North America, Inc., and Frederick W. Burklein, Harris County, TX 2014-.
Provided deposition testimony.

Richard C.B. Juca v. Larry H. Miller Corporation, Peoria, AZ, 2014.

General Motors, LLC v. Leep Chev, LLC, d/b/a Lujack's Chevrolet, Scott County, IA. 2014-2015
Provided deposition testimony.

Century Motors Corporation v. Chrysler Group, LLC et al., Wentzville, MO 2014-2015.
Provided deposition and trial testimony.

Keyes European, LLC v. Encino Mercedes, LLC, Steve Zubieta, David Floodquist, Shimon Broshinsky and Does 1-20, Los Angeles, CA, 2014.

Ohio Auto Dealers Association, 2014.

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Santa Cruz Nissan, Inc., dba Santa Cruz Nissan v. Nissan North America, Inc., Santa Cruz, CA 2013-2015.
Provided deposition and hearing testimony.

Majid Salim v. Henry Khachaturian aka Hank Torian, Torian Holdings, Fremont Automobile Dealership, LLC., and Does 1-20, Alameda County, CA, 2013-2014.
Provided deposition and trial testimony.

GMAC v. Lloyd Belt, Lloyd Belt GM Center, Inc., and Lloyd Belt Chrysler, Inc., Eldon, MO 2013-2014.
Provided deposition testimony.

General Motors v. Englewood Auto Group, LLC, Englewood, NJ, 2012-2014.

Bob Wade Autoworld v. Ford Motor Company, Harrisonburg, VA, 2011-2012.
Provided hearing testimony.

Van Wie Chevrolet, Inc. d/b/a Evans Chevrolet v. General Motors LLC and Sharon Chevrolet, Inc., Baldwinsville, NY, 2012-2017.
Provided deposition testimony.

Midcon Compression L.L.C. v. Loving County Appraisal District, Loving County, TX, 2013.
Provided deposition testimony.

Texas Automobile Dealers Association, Austin, TX, 2013.
Provided hearing testimony before Business and Industry Committee in Texas H.O.R.

Tyler Automotive, Niles, MI*,* 2013.

Sutton Suzuki, Matteson, IL 2013.

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Provided deposition and hearing testimony.

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Goold Patterson, Las Vegas, NV, 2012.

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Randy Reed Nissan, 2012.

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Provided deposition testimony.

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Provided hearing testimony.

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Provided hearing testimony.

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Carson CJ, LLC and Kenneth Phillips v. Sonic Automotive, Inc., Sonic-Carson F, Inc, Avalon Ford, Inc. dba Don Kott Chrysler Jeep, and Does 1 - 100, Los Angeles, CA, 2010-2012.
Provided deposition and hearing testimony.

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Ionia Automotive Management, LLC and Beverly Kelly v. Berger Motor Sales, Ned Berger, Jr, LC and Ned Berger Jr., Mason, MI, 2012-2013.

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Provided deposition and hearing testimony.

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Provided trial testimony.

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Provided deposition testimony and hearing testimony.

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Provided deposition and hearing testimony.

Laidlaw's Harley-Davidson Sales, Inc. dba Laidlaw's Harley-Davidson v. Harley-Davidson Motor Company, Sacramento, CA, 2011- 2012.
Provided deposition and hearing testimony.

Agrillo v. Martinez, Tucson, AZ, 2011.

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Provided hearing testimony.

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Mega RV Corp. v. Mike Thompson Recreational Vehicles, Irvine, CA, 2010-.
Provided deposition testimony.

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Bass Sox Mercer, Tallahassee, FL, 2011-.

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JP Chevrolet, Peru, IL, 2010-2011.

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Provided deposition testimony.

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Provided hearing testimony.

Ron Westphal Chevrolet v. General Motors, LLC, Aurora, CO, 2010.

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Leep Chev, LLC, v. General Motors, LLC, South Bend, IN, 2010.

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Provided hearing testimony.

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Provided hearing testimony.

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Provided hearing testimony.

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Provided declaration.

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Provided deposition and hearing testimony.

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Provided deposition testimony.

Wiggin & Nourie, P.A., Manchester, NH, 2007-2008.

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Fort Collins Nissan, Inc. d/b/a Tynan's Kia, v. Kia Motors America, Inc., (U.S. District Court District of Colorado).
Provided deposition testimony 8/2018.

Star Houston, Inc. d/b/a Star Motor Cars v. Volvo Cars of North America, LLC, (Texas State Office of Administrative Hearings).
Provided deposition testimony 8/2018 and hearing testimony 9/2018.

Capitol Buick GMC, LLC v. General Motors LLC, (State of Maryland Before the Motor Vehicle Administration)
Provided deposition testimony 1/2018 and hearing testimony 3/2018.

Crown Chrysler Jeep, Inc. d/b/a Crown Kia v. Kia Motors America, (Ohio Motor Vehicle Dealer Board)
Provided deposition testimony 11/2017 and hearing testimony 2/2018-3/2018.

Folsom Chevrolet, Inc. dba Folsom Chevrolet v. General Motors, LLC, (State of California New Motor Vehicle Board)
Provided deposition testimony 11/2017 and 2/2018; and hearing testimony 2/2018.

Sioux City Truck Sales, Inc. v. Peterbilt Motors Company, (Iowa Department of Inspections and Appeals, Administrative Hearing Division)
Provided deposition and hearing testimony 2/2018.

Duncan McDonald v. Samsung Electronics Canada, Inc., (Ontario Superior Court of Justice)
Provided cross-examination testimony 12/2017.

Sunnyvale Automotive Inc., dba Sunnyvale Ford Lincoln v. Ford Motor Company, (State of California New Motor Vehicle Board)
Provided deposition testimony 10/2017.

Rebecca Romeo and Joe Romeo v. Ford Motor Company and Ford Motor Company Canada, Limited, (Ontario Superior Court of Justice)
Provided cross-examination testimony 10/2017.

Charles Johnson, et al. individually and on behalf of all others similarly situated v. Ford Motor Company, (U.S. District Court for the Southern District of West Virginia, Huntington Division)
Provided deposition testimony 7/2017.

Northwest Hills Chrysler Jeep, LLC; Gengras Chrysler Dodge Jeep, LLC; Crowley Jeep Dodge, Inc.; Papa's Dodge, Inc. v. FCA US, LLC and Mitchell Dodge, Inc., (Connecticut Department of Motor Vehicles).
Provided deposition testimony 12/2016 and 1/2017, and hearing testimony 5/2017.

Star Houston, Inc. d/b/a Star Motor Cars v. VCWH. LLC d/b/a Volvo Cars West Houston and Volvo Cars of North America, LLC, (Texas State Office of Administrative Hearings).
Provided deposition testimony 5/2017.

In the Matter of the Estate of Richard C. Poe, Richard C. Poe, II v. Paul O. Sergent at al., (Probate Court Number One El Paso, TX)
Provided deposition testimony 4/2017

Ball Automotive Group d/b/a Ball Kia, v. Kia Motors America, Inc., (State of California New Motor Vehicle Board).
Provided deposition testimony 4/2017.

Yogesh Kalra v Mercedes-Benz Canada Inc., Daimler AG, Mercedes-Benz USA LLC and Mercedes-Benz Financial Services Canada Corporation, (Ontario Superior Court of Justice).
Provided cross-examination (deposition) testimony 3/2017.

Lake Forest Sports Cars, LTD v. Aston Martin Lagonda of North America, Inc., (Motor Vehicle Review Board State of Illinois).
Provided deposition testimony 3/2017.

GB Auto Corporation d/b/a Frisco Kia, v. Corinth Automotive Plano, d/b/a Central Kia of Plano, Kia Motors America, Inc. Intervenor, (Texas Department of Motor Vehicles, Motor Vehicle Division).
Provided deposition testimony 2/2017 and 3/2017.

John Deere Construction & Forestry Company v. Rudd Equipment Company, Inc., (American Arbitration Association).
Provided hearing testimony 2/2017.

Walter Timmons Enterprises, Inc. dba Timmons Subaru v. Subaru of America, (State of California New Motor Vehicle Board).
Provided deposition testimony 11/2016

Motor Werks Partners, LP, v. General Motors, LLC (United States District Court for the Northern District of Illinois Eastern Division).
Provided deposition testimony 10/2016.

Mathew Enterprise, Inc. v. FCA f/k/a Chrysler Group LLC, (U.S. District Court Northern District of California).
Provided deposition testimony 12/2015 and 3/2016, and trial testimony 9/29/16.

Jeff Looper et al., v. FCA US LLC, f/k/a Chrysler Group, LLC, et al., (United States District Court Central District of California, Eastern Division).
Provided deposition testimony 9/2016.

Dependable Dodge, Inc. v. Fiat Chrysler Automobiles, Inc., (State of California New Motor Vehicle Board).
Provided deposition testimony 7/2016 and hearing testimony 9/2016.

Wayzata Nissan, LLC v. Nissan North America, Inc., et al., (State of Minnesota District Court, Fourth Judicial District, Hennepin County).
Provided pre-filed trial testimony 7/2016.

Grossinger Autoplex, Inc. v. General Motors, LLC, (Office of the Secretary of State of Illinois before the Motor Vehicle Review Board).
Provided deposition testimony 1/2016 and hearing testimony 3/2016.

CNH America, LLC n/k/a CNH Industrial America, LLC v. Quinlan's Equipment, Inc., (State of Wisconsin Circuit Court Racine County).
Provided deposition testimony 1/2016.

Navistar v. New Baltimore Garage, Inc. (Commonwealth of Virginia Department of Motor Vehicles).
Provided hearing testimony 10/2015.

Bates Nissan, Inc., v. Nissan North America Inc., (State Office of Administrative Hearings,
Provided deposition testimony 7/2015 and hearing testimony 9/2015.

TrueCar, Inc. v. Sonic Automotive, Inc., and Sonic Divisional Operations, LLC (United States District Court for the Central District of California).
Provided deposition testimony 5/2015.

Lost New Volkswagen TDI Sales

Part 1 - Dealers' Monthly Average TDI Sales

Sum of Dealers' TDI Sales from 2013 - 8/2015 ÷ Number of Months in 2013 - 8/2015 = Dealers' Monthly Average TDI Sales

Part 2 - Dealers' Lost New TDI Sales

Dealers' Monthly Average TDI Sales **x** Number of Months in the Following Time Periods:
9/2015 - 12/2015
2016
2017
2018
2019
2020
= Dealers' Lost New TDI Sales in :
9/2015 - 12/2015
2016
2017
2018
2019
2020

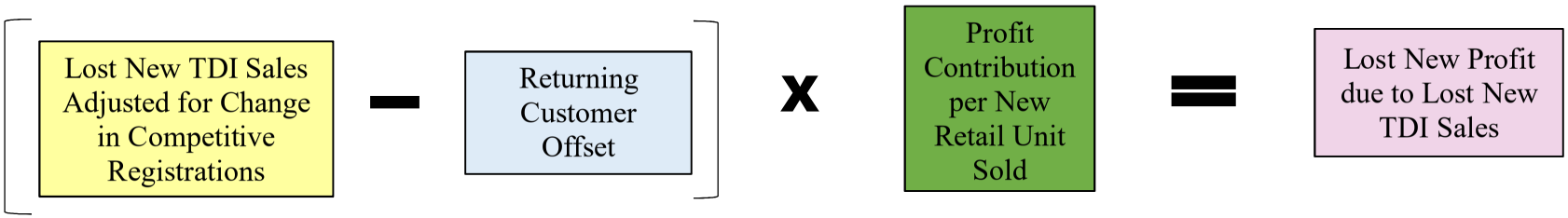
Part 3 - Dealers' Lost New TDI Sales Adjusted for Change in Competitive Registrations

Dealers' Lost New TDI Sales in :
9/2015 - 12/2015
2016
2017
2018
2019
2020
x Adjustment for Change in Competitive Registrations
= Dealers' Lost New TDI Sales Adjusted for Change in Competitive Registrations in :
9/2015 - 12/2015
2016
2017
2018
2019
2020

NOTE: Time Periods are modified for the TDI Touareg which had sales through 10/2015.

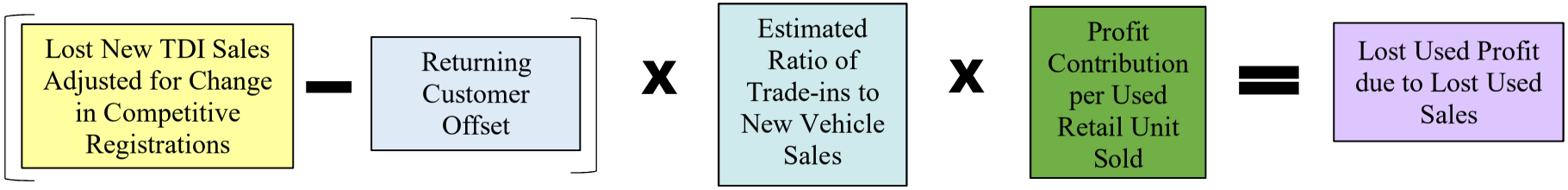
Returning Customer Offset

Lost New Vehicle Department Profit Due to Lost New Volkswagen TDI Sales



NOTE: Calculations are for each Time Period: 9/2015 - 12/2015, 2016, 2017, 2018, 2019, and 2020.

Lost Used Profit Due to Lost Used Sales



NOTE: Calculations are for each Time Period: 9/2015 - 12/2015, 2016, 2017, 2018, 2019, and 2020.

Volkswagen TDI Buyback

- 3/2017 = Midpoint of Buyback

- Estimated Actual TDI UIOs by Model Year to apply the 85% buyback factor

- Applied buyback factor equally on UIOs by year

Lost Service & Parts Sales Dollars Due to Buyback

Estimated Volkswagen TDI 6-year UIOs

Dealers' New TDI Sales from 2012 - 2015 **−** Estimated Annual Scrappage **=** Estimated 6-year TDI UIOs for 2017 - 2020

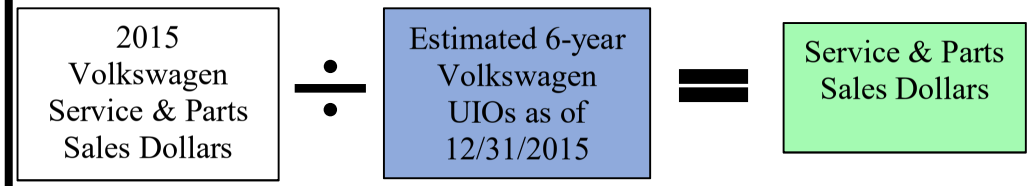
Lost Service & Parts Sales Due to Buyback

Estimated 6-year TDI UIOs for 2017 - 2020 **x** Lost Share of TDI 6-year UIOs After Buyback **x** Service & Parts Sales Dollars per 6-year UIO **=** Lost Service & Parts Sales Dollars

Service and Parts Sales Dollars per 6-year Volkswagen UIO

Estimated 6-year Volkswagen UIOs

Sales per 6-year Volkswagen UIO



Lost Service & Parts Sales Dollars Due to Lost New TDI Sales

Part 1 - Estimated Lost Volkswagen TDI 6-year UIOs

Dealers' Lost New TDI Sales from 9/2015 - 2020 **−** Estimated Annual Scrappage Rate (1.5%) **=** Estimated Lost TDI 6-year UIOs for 2015 - 2020

Part 2 - Lost Service & Parts Sales Due to Lost New TDI Sales

Estimated Lost TDI 6-year UIOs for 2015 - 2020 **x** Service & Parts Sales Dollars per 6-year UIO **=** Lost Service & Parts Sales Dollars Due to Lost New TDI Sales

Lost Service & Parts Profit

Part 1 - Total Lost Sales Dollars

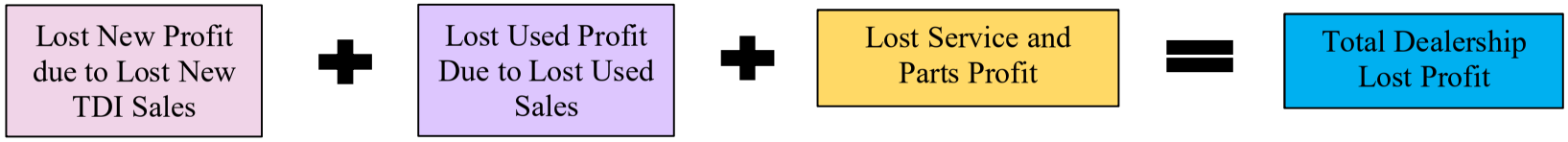
Lost Service and Parts Sales Dollars Due to Buyback + Lost Service and Parts Sales Dollars Due to Lost New TDI Sales = Total Lost Service & Parts Sales Dollars

Part 2 - Lost Service & Parts Profit

Total Lost Service & Parts Sales Dollars ÷ $1,000 X Profit Contribution per $1,000 of Service and Parts Sales = Lost Service & Parts Profit

NOTE: Calculations are for each Time Period: 9/2015 - 12/2015, 2016, 2017, 2018, 2019, and 2020.

Total Dealership Lost Profit



NOTE: Calculations are for each Time Period: 9/2015 - 12/2015, 2016, 2017, 2018, 2019, and 2020.

Present Value of Total Dealership Lost Profit, Lost Terminal Value, and Total Damages

Part 1 - Present Value of Total Dealership Lost Profit

Total Dealership Lost Profit **x** Present Value Adjustment/ Discount Factor **=** Present Value of Total Dealership Lost Profit

Part 2 - Lost Terminal Value

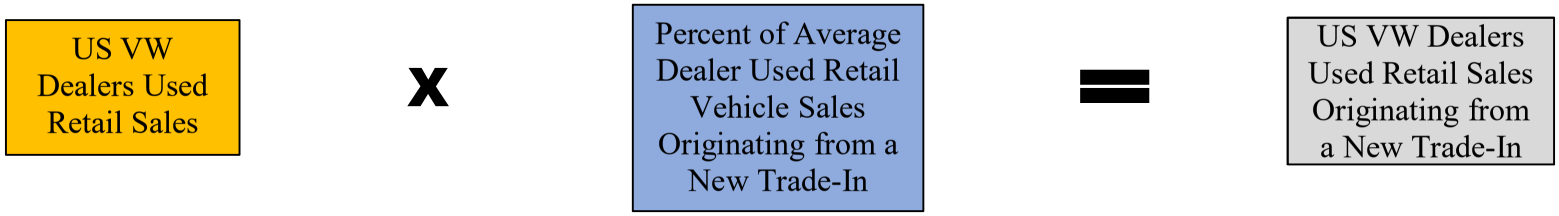
Present Value of Total Dealership Lost Profit for **2020** **x** Multiple of 4 **=** Lost Terminal Value

Part 3 - Total Damages

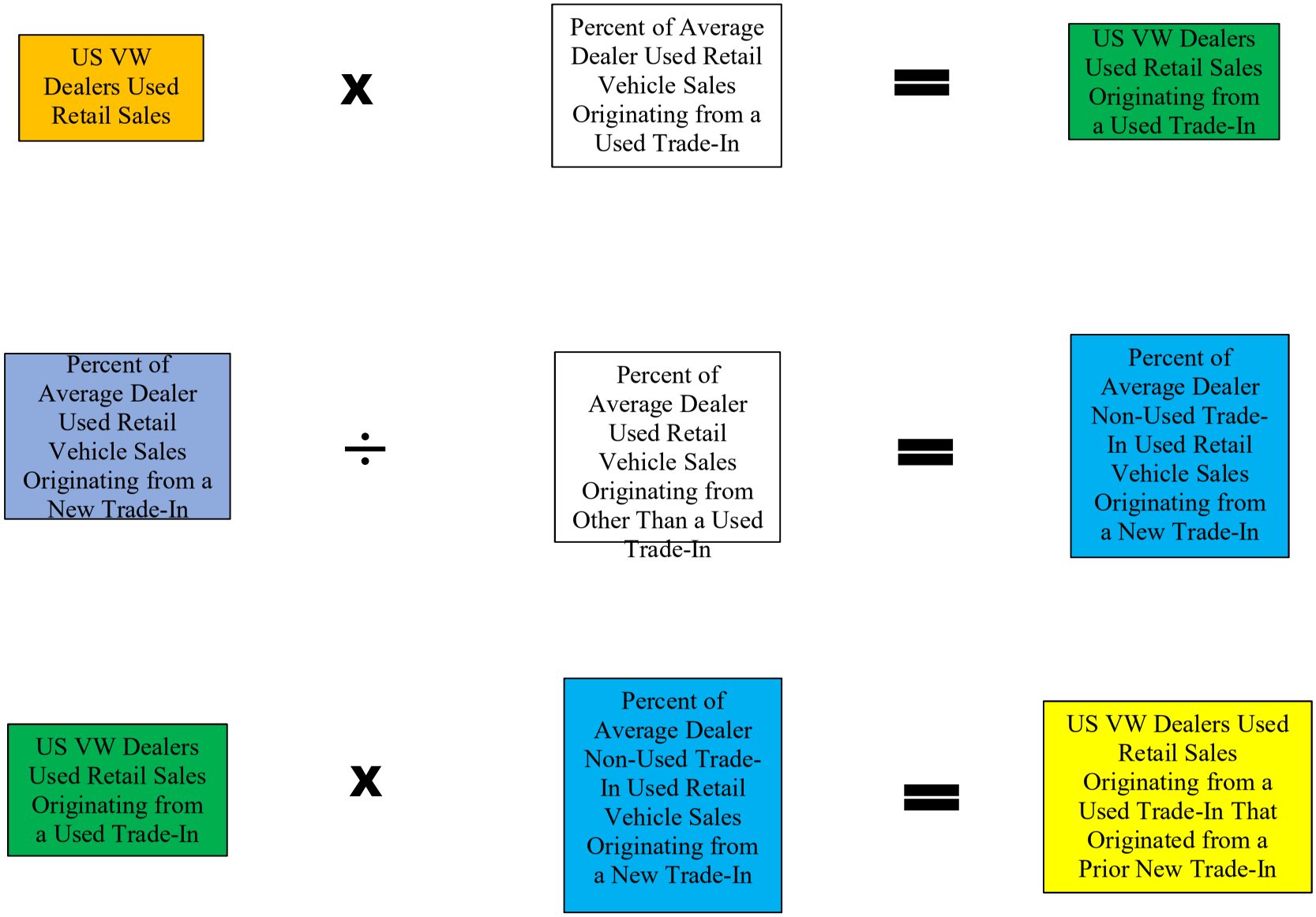
Sum of Present Value of Total Dealership Lost Profit **+** Lost Terminal Value **=** Total Damages **x** Treble Damages **=** Total Damages Including Treble Damages

NOTE: Calculations are for each Time Period: 9/2015 - 12/2015, 2016, 2017, 2018, 2019, and 2020.

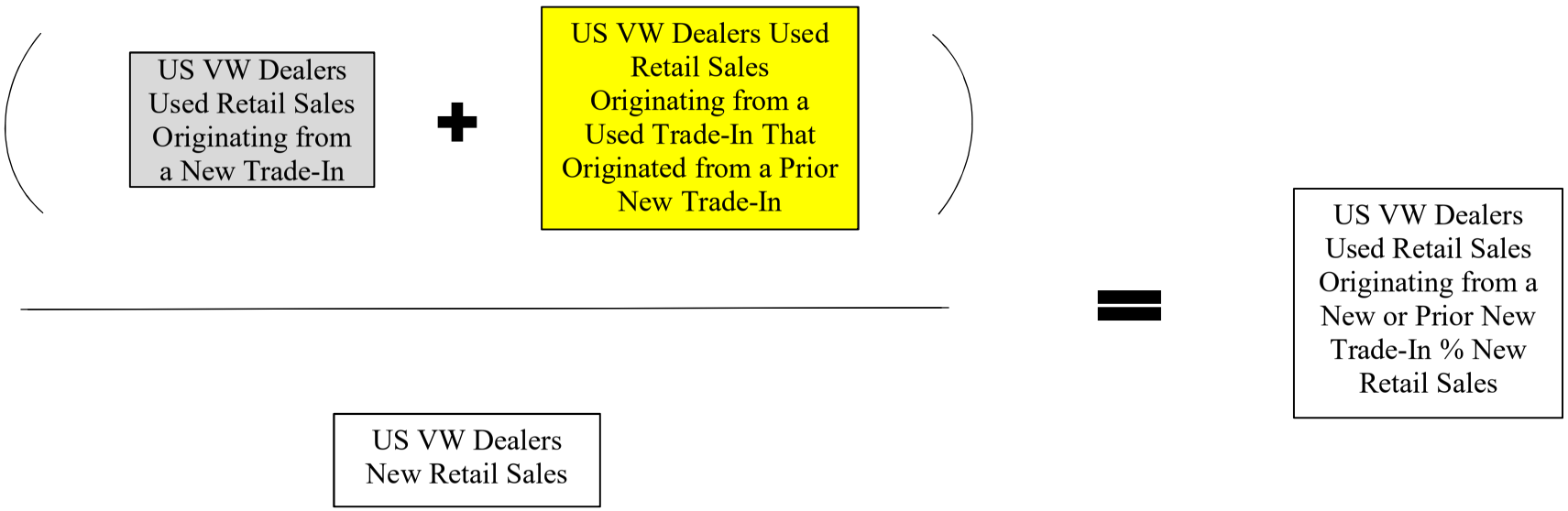
Used Sales Originating Directly from a New Trade-In



Used Sales Originating Indirectly from a New Trade-In



Used Sales Resulting from a New Sale as a Percent of New Sales



Adjustment for Change in New Competitive Retail Car + Light Truck Registrations U.S. 9/2015 - 2018

	(1) Competitive Registrations	(2) Monthly Average	(3) (2) / 426,347 See Note Adjustment for Change in Competitive Registrations
2013	5,091,203		
2014	5,110,304		
8/2015 YTD	3,441,605		
Sum	13,643,112	426,347	
9/2015 - 12/2015	1,607,304	401,826	0.942
2016	4,736,925	394,744	0.926
2017	4,557,510	379,793	0.891
2018	4,128,086	344,007	0.807

NOTE: Competitive Registrations include IHS Segments with more than 1 Volkswagen TDI Registration in the U.S. from 2013 - 8/2015. Figures in Column (3) are shown rounded but will be unrounded in their application.

SOURCE: The Fontana Group, Inc.
DATA: IHS Automotive, 2013 (9/2018 Update)
IHS Automotive, 2014 - 2015 (10/2018 Update).
IHS Automotive, 2016 - 2018 (3/2019 Update).
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New Volkswagen Non-TDI Registrations
Natural Market Share
U.S.
2013 - 8/2015

IHS Segments with Volkswagen TDI Models	Volkswagen TDI Registrations	Volkswagen Non-TDI Registrations	Competitive Registrations	Competitive Less Volkswagen TDI Registrations	Volkswagen Non-TDI % Competitive Less Volkswagen TDI Registrations
Non-Luxury Traditional Compact					
Beetle	8,178	64,599			1.19%
Golf	19,632	27,714			0.51%
Golf Sportwagen	6,782	1,772			0.03%
Jetta	91,018	253,472			4.66%
Sum	125,610	347,557	5,562,044	5,436,434	**6.39%**
Non-Luxury Traditional Mid-size					
CC	0	28,112			0.54%
Passat	73,575	140,049			2.71%
Sum	73,575	168,161	5,235,298	5,161,723	**3.26%**
Non-Luxury Mid-size CUV					
Touareg	9,032	7,620	2,845,770	2,836,738	**0.27%**
Sum	208,217	523,338	13,643,112	13,434,895	**3.90%**

SOURCE: The Fontana Group, Inc
DATA: IHS Markit, 2013 (12/2018 Update).
IHS Markit, 2014 - 8/2015 (1/2019 Update).
F:\VWDB: NATSHR XLSX:SNMS:99:TKHIHL

Used Retail Sales Originating from a New Trade-In or Prior New Trade-In as a Percent of New Retail Sales
U.S. Volkswagen Dealers
9/2015 YTD

(1)	(2)	(3) (1) * (2)	(4)	(5) (1) * (4)	(6) (2) / [1 - (4)]	(7) (5) * (6)	(8)	(9) [(3) + (7)] / (8)
U.S. Volkswagen Dealers Used Retail Sales	Percent of Average Dealer Used Retail Vehicle Sales Originating from a New Trade-In*	U.S. Volkswagen Dealers Used Retail Sales Originating from a New Trade-In	Percent of Average Dealer Used Retail Vehicle Sales Originating from a Used Trade-In*	U.S. Volkswagen Dealers Used Retail Sales Originating from a Used Trade-In	Percent of Average Dealer Non-Used Trade-In Used Retail Vehicle Sales Originating from a New Trade-In*	U.S. Volkswagen Dealers Used Retail Sales Originating from a Used Trade-In That Originated from a Prior New Trade-In	U.S. Volkswagen Dealers New Retail Sales	U.S. Volkswagen Dealers Used Retail Sales Originating from a New or Prior New Trade-In % New Retail Sales
281,658	42%	118,296	24%	67,598	55.3%	37,382	414,551	37.6%

* Figures represent full year 2015 data.

SOURCE: The Fontana Group, Inc.
DATA: NADA Data, 2015.
Composite Financial Reports, 9/2015 YTD, Q4 2015, and 2015.
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New and Used Retail Sales
U.S. Volkswagen Dealers
9/2015 YTD

	Midwest Region	Northeast Region	South Central Region	Southeast Region	Pacific Region 2015 Q4	Pacific Region 2015	Pacific Region 9/2015 YTD	U.S.
Dealer Count	130	140	100	131	115	115	115	
Average New VW Retail Sales	241.3	315.4	361.3	391.4	151.4	608.8	457.4	
Average New Other Makes Retail Sales	539.8	253.8	165.9	390.1	77.9	300.7	222.8	
Average New Retail Sales	781.1	569.2	527.2	781.5	229.3	909.5	680.2	
Average Used Retail Sales	583.4	324.8	460	484.4	138.0	580.5	442.5	
New Retail Sales	101,543	79,688	52,720	102,377			78,223	414,551
Used Retail Sales	75,842	45,472	46,000	63,456			50,888	281,658

NOTE: 9/2015 YTD was unavailable for Pacific Region, so it was calculated by subtracting 2015 Q4 from 2015.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 9/2015 YTD, Q4 2015, and 2015.
F:\VWDB: DMGSN.XLSX:SUNB:73:TKHDHL

Volkswagen Service + Parts & Accessories Sales per 6-Year UIO
U.S. Volkswagen Dealers
2015*

(1)	(2)	(3) (1) / (2)
Volkswagen Service + Parts & Accessories Sales	**Estimated Volkswagen 6-Year UIOs as of Dec. 31, 2015**	**Sales per 6-Year UIO**
$2,392,466,995	2,068,689	$1,157

* 2015 Annualized based on 9/2015 YTD data.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 9/2015 YTD.
Auto News, 2010 - 2015.
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Estimated 6-Year Volkswagen Units in Operation (UIOs)
U.S.
As of December 31, 2015

	(1) Dealers' Nationwide New Volkswagen Retail Sales	(2) Estimated Annual Scrappage Rate	(3) (1) * [1 - (2)] ^ Years Until Dec. 31, 2015 Estimated Volkswagen UIOs as of Dec. 31, 2015
2010	256,830	1.5%	238,137
2011	324,402	1.5%	305,371
2012	438,133	1.5%	418,711
2013	407,704	1.5%	395,565
2014	366,970	1.5%	361,465
2015	349,440	0.0%	349,440
Sum			2,068,689

SOURCE: The Fontana Group, Inc.
DATA: Auto News, 2010 - 2015
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December 31, 2018 Present Value Discount Factor (PVDF)*
Based on Calculated Real Cost of Equity**
2018 - 2029

	Calculated Real Cost of Equity**	Dec. 31, 2018 PVDF*
2018		1.000
2019	13.25%	0.883
2020	13.25%	0.780
2021	17.94%	0.661
2022	17.94%	0.560
2023	17.94%	0.475
2024	17.94%	0.403
2025	17.94%	0.342
2026	17.94%	0.290
2027	17.94%	0.246
2028	17.94%	0.209
2029	17.94%	0.177

* Dec. 31, 2018 PVDF will be used to adjust future year dollars to their values as of Dec. 31, 2018.
2018 = 1.000; 2019 - 2029 = Previous Period's PVDF / (1 + Calculated Real Cost of Equity).
** 2019 - 2020 uses discount rate equal to CAPM + Size Premium. 2021 - 2029 uses discount rate equal to 20%.

SOURCE: The Fontana Group, Inc.
DATA: Valuation Handbook, Guide to Cost of Capital, 2016.
Valuation Handbook, Industry Cost of Capital, 3/2016.
Bureau of Economic Analysis Internet Site, 3/28/2019.
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Capital Asset Pricing Model (CAPM) and CAPM + Size Premium
12/2015

(1)	Risk-Free Rate*	2.68%
(2)	Beta**	1.3
(3)	Equity Risk Premium***	6.90%
(4) (1) + [(2) * (3)]	CAPM	11.65%
(5)	Micro-Cap Size Premium	3.58%
(6) (4) + (5)	CAPM + Size Premium	15.23%

* Long-Term (20-Year) U.S. Treasury Coupon Bond Yield as of 12/31/2015.
** Median Vasicek-Adjusted Beta (Levered) for Automotive Dealers and Gasoline Service Stations (SIC Code 55) as of 3/31/2016.
*** Long-Horizon Expected Equity Risk Premium (Historical): Large company stock total returns minus long-term government bond income returns as of 12/31/2015.

SOURCE: The Fontana Group, Inc.
DATA: Valuation Handbook, Guide to Cost of Capital, 2016.
Valuation Handbook, Industry Cost of Capital, 3/2016.
F:\VWDB: CAPMBERT.XLSX:SDAT:13:TDIDHE

Calculated Real Cost of Equity Based on CAPM + Size Premium and Implicit Price Deflator (GDP)

(1)	(2)	(3) [(1) - (2)] / [(2) + 1.00]
CAPM + Size Premium	**Five-Year Average Implicit Price Deflator (GDP) % Change from Previous Year**	**Calculated Real Cost of Equity**
15.23%	1.75%	13.25%

SOURCE: The Fontana Group, Inc.
DATA: Valuation Handbook, Guide to Cost of Capital, 2016.
Valuation Handbook, Industry Cost of Capital, 3/2016.
Bureau of Economic Analysis Internet Site, 3/28/2019.
F:\VWDB: DMGSN.XLSX:SCOE:73:TKHDHL

Implicit Price Deflator (GDP) Percent Change from Previous Year 2011 - 2015

	Implicit Price Deflator (GDP)	Implicit Price Deflator (GDP) % Change from Previous Year
2010	96.111	
2011	98.118	2.09%
2012	100.000	1.92%
2013	101.755	1.76%
2014	103.680	1.89%
2015	104.789	1.07%
	Average:	1.75%

SOURCE: The Fontana Group, Inc.
DATA: Bureau of Economic Analysis Internet Site, 3/28/2019.
F:\VWDB: DMGSN.XLSX:SIPD:73:TKHDHL

Calculated Real Cost of Equity Based on 20% Discount Rate and Implicit Price Deflator (GDP)

(1)	(2)	(3) [(1) - (2)] / [(2) + 1.00]
Discount Rate	**Five-Year Average Implicit Price Deflator (GDP) % Change from Previous Year**	**Calculated Real Cost of Equity**
20.00%	1.75%	17.94%

SOURCE: The Fontana Group, Inc.
DATA: Bureau of Economic Analysis Internet Site, 3/28/2019.
F:\VWDB: DMGSNA.XLSX:SC20:73:TMTDHL

Inflation Adjustment Factor*
(Base = 2018)
2013 - 2018

	Implicit Price Deflator (GDP)	Inflation Adjustment Factor* (Base = 2018)
2013	101.755	1.085
2014	103.680	1.065
2015	104.789	1.053
2016	105.935	1.042
2017	107.948	1.023
2018	110.382	1.000

* Inflation Adjustment Factor = 2018 Implicit Price Deflator / Implicit Price Deflator.

SOURCE: The Fontana Group, Inc.
DATA: Bureau of Economic Analysis Internet Site, 3/28/2019.
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Average New Volkswagen Retail and Used Vehicle Department Profit Contribution per Retail Unit Sold (in 2018 Dollars) U.S. Volkswagen Dealers 2013 - 9/2015

	(1)	(2)	(3)	(4) (1) * (3)	(5) (2) * (3)
	Profit Contribution per Retail Unit Sold (in Resp. Yr. $s)			Profit Contribution per Retail Unit Sold (in 2018 $s)	
	New Volkswagen Retail Vehicle Department	Used Vehicle Department	Inflation Adjustment Factor (Base = 2018)	New Volkswagen Retail Vehicle Department	Used Vehicle Department
2013	$1,135	$821	1.085	$1,231	$891
2014	$602	$467	1.065	$641	$497
9/2015 YTD	$939	$632	1.053	$989	$665
Average				**$954**	**$684**

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015
Bureau of Economic Analysis Internet Site, 3/28/2019
F:\VWDB: DMGSNA.XLSX:SPC:73:TOTOHL

Average Volkswagen Service + Parts & Accessories Departments
Profit Contribution per $1,000 of Sales
U.S. Volkswagen Dealers
2013 - 9/2015

	Profit Contribution per $1,000 of Sales
2013	$258
2014	$259
9/2015 YTD	$278
Average	$265

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015.
F:\VWDB: DMGSN.XLSX:SPCF:73:TKHDHL

Profit Contribution by Department
U.S. Volkswagen Dealership
2013 - 9/2015

New Volkswagen Vehicle Department

	Profit Contribution Dollars	Retail Vehicles Sold/Leased	Profit Contribution per Retail Vehicle Sold/Leased
2013	$374,484,050	329,936	$1,135
2014	$176,381,749	292,806	$602
9/2015 YTD	$203,222,085	216,444	$939

Used Volkswagen Vehicle Department

	Profit Contribution Dollars	Retail Vehicles Sold/Leased	Profit Contribution per Retail Vehicle Sold/Leased
2013	$116,086,798	141,335	$821
2014	$68,363,269	146,449	$467
9/2015 YTD	$74,701,933	118,192	$632

Volkswagen Service + Volkswagen P&A Departments

	Profit Contribution Dollars	Volkswagen Service + P&A Sales	Profit Contribution per $1,000 of Sales
2013	$548,060,352	$2,124,418,713	$258
2014	$588,396,114	$2,268,596,529	$259
9/2015 YTD	$498,407,330	$1,794,350,246	$278

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015
F:\VWDB: PCVWUSR.XLSX:SPC:73:TKHLHL

New Volkswagen Vehicle Department Profit Contribution Dollars
U.S. Volkswagen Dealership
2013 - 9/2015

	Average Dealership Profit Contribution Dollars		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	$610,510	$248,927	$257,656
Northeast	$420,762	$163,265	$263,810
Pacific	$834,527	$470,152	$538,204
South Central	$734,880	$354,998	$329,173
Southeast	$628,155	$207,565	$281,727

	Dealer Count		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	133	137	130
Northeast	148	147	140
Pacific	107	120	117
South Central	86	100	100
Southeast	125	127	131

	Total Profit Contribution Dollars		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	$81,197,830	$34,102,999	$33,495,280
Northeast	$62,272,776	$23,999,955	$36,933,400
Pacific	$89,294,389	$56,418,240	$62,969,868
South Central	$63,199,680	$35,499,800	$32,917,300
Southeast	$78,519,375	$26,360,755	$36,906,237
Sum	**$374,484,050**	**$176,381,749**	**$203,222,085**

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015
F:\VWDB: PCVWUSR XLSX:S$N:73:TKHLHL

Used Volkswagen Vehicle Department Profit Contribution Dollars
U.S. Volkswagen Dealership
2013 - 9/2015

	Average Dealership Profit Contribution Dollars		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	$199,408	$103,691	$112,375
Northeast	$172,870	$114,552	$141,733
Pacific	$211,887	$159,075	$186,174
South Central	$198,465	$70,466	$87,670
Southeast	$193,927	$88,054	$74,055

	Dealer Count		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	133	137	130
Northeast	148	147	140
Pacific	107	120	117
South Central	86	100	100
Southeast	125	127	131

	Total Profit Contribution Dollars		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	$26,521,264	$14,205,667	$14,608,750
Northeast	$25,584,760	$16,839,144	$19,842,620
Pacific	$22,671,909	$19,089,000	$21,782,358
South Central	$17,067,990	$7,046,600	$8,767,000
Southeast	$24,240,875	$11,182,858	$9,701,205
Sum	**$116,086,798**	**$68,363,269**	**$74,701,933**

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015
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Volkswagen Service + Volkswagen Parts & Accessories Departments
Profit Contribution Dollars
U.S. Volkswagen Dealership
2013 - 9/2015

Average Dealership Profit Contribution Dollars

Region	2013	2014	9/2015 YTD
Midwest	$747,697	$748,748	$631,372
Northeast	$724,641	$799,376	$704,762
Pacific	$1,196,658	$1,186,199	$1,056,371
South Central	$918,907	$852,345	$728,666
Southeast	$1,074,411	$1,108,118	$925,193

Dealer Count

Region	2013	2014	9/2015 YTD
Midwest	133	137	130
Northeast	148	147	140
Pacific	107	120	117
South Central	86	100	100
Southeast	125	127	131

Total Profit Contribution Dollars

Region	2013	2014	9/2015 YTD
Midwest	$99,443,701	$102,578,476	$82,078,360
Northeast	$107,246,868	$117,508,272	$98,666,680
Pacific	$128,042,406	$142,343,880	$123,595,407
South Central	$79,026,002	$85,234,500	$72,866,600
Southeast	$134,301,375	$140,730,986	$121,200,283
Sum	**$548,060,352**	**$588,396,114**	**$498,407,330**

SOURCE: The Fontana Group, Inc
DATA: Composite Financial Reports, 2013 - 2015
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New Volkswagen Vehicle Department Retail Vehicles Sold/Leased
U.S. Volkswagen Dealership
2013 - 9/2015

	Average Retail Vehicles Sold/Leased		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	392.0	318.3	241.3
Northeast	502.0	431.3	315.4
Pacific	708.0	574.4	457.4
South Central	593.0	484.3	361.3
Southeast	614.0	538.9	391.4

	Dealer Count		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	133	137	130
Northeast	148	147	140
Pacific	107	120	117
South Central	86	100	100
Southeast	125	127	131

	Total Retail Vehicles Sold/Leased		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	52,136	43,607	31,369
Northeast	74,296	63,401	44,156
Pacific	75,756	68,928	53,516
South Central	50,998	48,430	36,130
Southeast	76,750	68,440	51,273
Sum	**329,936**	**292,806**	**216,444**

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015
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Used Volkswagen Vehicle Department Retail Vehicles Sold/Leased
U.S. Volkswagen Dealership
2013 - 9/2015

	Average Retail Vehicles Sold/Leased		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	198.0	196.8	161.0
Northeast	203.0	206.6	163.0
Pacific	285.0	281.2	241.5
South Central	267.0	243.6	203.0
Southeast	252.0	244.2	197.6

	Dealer Count		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	133	137	130
Northeast	148	147	140
Pacific	107	120	117
South Central	86	100	100
Southeast	125	127	131

	Total Retail Vehicles Sold/Leased		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	26,334	26,962	20,930
Northeast	30,044	30,370	22,820
Pacific	30,495	33,744	28,256
South Central	22,962	24,360	20,300
Southeast	31,500	31,013	25,886
Sum	**141,335**	**146,449**	**118,192**

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015
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Volkswagen Service + Volkswagen Parts & Accessories Departments Sales
U.S. Volkswagen Dealership
2013 - 9/2015

	Average Volkswagen Service + Volkswagen P&A Sales		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	$2,999,544	$3,099,872	$2,427,872
Northeast	$3,011,786	$3,241,415	$2,582,248
Pacific	$4,448,139	$4,255,261	$3,565,930
South Central	$3,643,560	$3,463,538	$2,808,015
Southeast	$3,923,504	$4,019,220	$3,199,976

	Dealer Count		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	133	137	130
Northeast	148	147	140
Pacific	107	120	117
South Central	86	100	100
Southeast	125	127	131

	Total Volkswagen Service + Volkswagen P&A Sales		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	$398,939,352	$424,682,464	$315,623,360
Northeast	$445,744,328	$476,488,005	$361,514,720
Pacific	$475,950,873	$510,631,320	$417,213,810
South Central	$313,346,160	$346,353,800	$280,801,500
Southeast	$490,438,000	$510,440,940	$419,196,856
Sum	**$2,124,418,713**	**$2,268,596,529**	**$1,794,350,246**

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015
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New Volkswagen Vehicle Department Profit Contribution
Midwest Region Average Dealer
2013 - 9/2015

Line Item	2013	2014 (a)	9/2015 YTD
Gross Profit Including Cost of Sales Adjustment LIFO	789,241	796,006	692,332
Reversal of VW Cost of Sales Adjustment LIFO (b)	10,908	6,220	391
Additions to Income (c)	487,258	97,087	35,960
Gross Profit Sum	**$1,287,407**	**$899,313**	**$728,683**
Variable Selling Expenses	**$414,094**	**$386,136**	**$273,090**
Total Employment Expenses	415,549	413,550	316,847
LESS: Salaries - Owners	(18,548)	(18,303)	(14,452)
Total Semi-Fixed Expenses	128,742	133,341	93,535
LESS: Other Depreciable Assets - Expenses	(137)	(88)	(57)
Semi-Variable Expenses	**$525,606**	**$528,500**	**$395,873**
Variable Portion of Semi-Variable Expenses (d)	**$262,803**	**$264,250**	**$197,937**
Profit Contribution Dollars	**$610,510**	**$248,927**	**$257,656**
Retail Vehicles Sold/Leased	**392.0**	**318.3**	**241.3**
Profit Contribution per Retail Vehicle Sold/Leased	**$1,557**	**$782**	**$1,068**

(a) Calculated from Q4 2014 Plus 9/2014 YTD.
(b) VW Cost of Sales Adjustment LIFO calculated based on New Volkswagen share of New Vehicle Department Retail Vehicle Cost of Goods Sold.
(c) Additions to Income consists of License & Documentary Fees, VW Performance Bonus, Holdback/Transaction Credit, VW MDO Bonus, and IDM Funds Received.
(d) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
F:\VWDB: PCVWMWR.XLSX:SNEW:73:TKHLHL

Used Volkswagen Vehicle Department Profit Contribution
Midwest Region Average Dealer
2013 - 9/2015

Line Item	2013	2014 (a)	9/2015 YTD
Gross Profit Including Cost of Sales Adjustment LIFO	629,563	532,430	413,398
Reversal of VW Cost of Sales Adjustment LIFO (b)	(157)	(738)	(458)
Additions to Income (c)	26,870	27,528	23,993
Gross Profit Sum	**$656,276**	**$559,220**	**$436,933**
Variable Selling Expenses	**$289,408**	**$287,978**	**$204,735**
Total Employment Expenses	262,070	257,791	184,010
LESS: Salaries - Owners	(10,835)	(10,611)	(7,643)
Total Semi-Fixed Expenses	83,866	88,037	63,335
LESS: Other Depreciable Assets - Expenses	(182)	(115)	(57)
Semi-Variable Expenses	**$334,919**	**$335,102**	**$239,645**
Variable Portion of Semi-Variable Expenses (d)	**$167,460**	**$167,551**	**$119,823**
Profit Contribution Dollars	**$199,408**	**$103,691**	**$112,375**
Retail Vehicles Sold/Leased	**198.0**	**196.8**	**161.0**
Profit Contribution per Retail Vehicle Sold/Leased	**$1,007**	**$527**	**$698**

(a) Calculated from Q4 2014 Plus 9/2014 YTD.
(b) VW Cost of Sales Adjustment LIFO calculated from Ratio of Used Volkswagen to Used Vehicle Department Retail Vehicle Cost of Goods Sold.
(c) Additions to Income consists of License & Documentary Fees.
(d) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
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Volkswagen Service + Volkswagen Parts & Accessories Department Profit Contribution
Midwest Region Average Dealer
2013 - 9/2015

Line Item	2013	2014 (a)	9/2015 YTD
Gross Profit - Service	825,638	824,901	686,244
Gross Profit Before Cost of Sales Adjustment LIFO (b) - P&A	496,254	520,795	394,833
Additions to Income (c)	10,387	0	0
Gross Profit Sum	**$1,332,279**	**$1,345,696**	**$1,081,077**
Variable Selling Expenses	**$101,337**	**$102,813**	**$74,902**
Total Employment Expenses	756,800	772,133	591,909
LESS: Salaries - Owners	(21,071)	(20,425)	(14,779)
Total Semi-Fixed Expenses	230,998	236,735	172,564
LESS: Other Depreciable Assets - Expenses	(238)	(173)	(88)
Semi-Variable Expenses	**$966,489**	**$988,270**	**$749,606**
Variable Portion of Semi-Variable Expenses (d)	**$483,245**	**$494,135**	**$374,803**
Profit Contribution Dollars	**$747,697**	**$748,748**	**$631,372**
Volkswagen Service + Volkswagen P&A Sales	**$2,999,544**	**$3,099,872**	**$2,427,872**
Profit Contribution per $1,000 of Sales	**$249**	**$242**	**$260**

(a) Calculated from Q4 2014 Plus 9/2014 YTD.
(b) Sum of VW Line items broken out on the P&A Department Gross Profit Detail.
(c) Additions to Income consists of VW Parts Achievement Bonus.
(d) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
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New Volkswagen Vehicle Department Profit Contribution
Northeast Region Average Dealer
2013 - 9/2015

Line Item	2013	2014	9/2015 YTD
Gross Profit Including Cost of Sales Adjustment LIFO	472,679	798,563	750,229
Reversal of VW Cost of Sales Adjustment LIFO*	7,698	5,136	(878)
Additions to Income**	731,568	140,120	60,568
Gross Profit Sum	**$1,211,945**	**$943,819**	**$809,919**
Variable Selling Expenses	**$513,045**	**$500,200**	**$344,366**
Total Employment Expenses	450,119	448,706	324,731
LESS: Salaries - Owners	(31,918)	(30,511)	(21,673)
Total Semi-Fixed Expenses	138,860	143,448	101,496
LESS: Other Depreciable Assets - Expenses	(786)	(935)	(1,068)
Semi-Variable Expenses	**$556,275**	**$560,708**	**$403,486**
Variable Portion of Semi-Variable Expenses* **	**$278,138**	**$280,354**	**$201,743**
Profit Contribution Dollars	**$420,762**	**$163,265**	**$263,810**
Retail Vehicles Sold/Leased	**502.0**	**431.3**	**315.4**
Profit Contribution per Retail Vehicle Sold/Leased	**$838**	**$379**	**$836**

* VW Cost of Sales Adjustment LIFO calculated based on New Volkswagen share of New Vehicle Department Retail Vehicle Cost of Goods Sold.

** Additions to Income consists of License & Documentary Fees, VW Performance Bonus, Holdback/Transaction Credit, VW MDO Bonus, and IDM Funds Received.

*** Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
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Used Volkswagen Vehicle Department Profit Contribution
Northeast Region Average Dealer
2013 - 9/2015

Line Item	2013	2014	9/2015 YTD
Gross Profit Including Cost of Sales Adjustment LIFO	565,263	525,007	426,656
Reversal of VW Cost of Sales Adjustment LIFO*	69	(434)	75
Additions to Income**	31,371	34,117	31,302
Gross Profit Sum	**$596,703**	**$558,690**	**$458,033**
Variable Selling Expenses	**$274,307**	**$287,397**	**$203,652**
Total Employment Expenses	240,830	251,874	181,685
LESS: Salaries - Owners	(16,994)	(17,638)	(10,964)
Total Semi-Fixed Expenses	75,624	79,683	54,979
LESS: Other Depreciable Assets - Expenses	(409)	(437)	(405)
Semi-Variable Expenses	**$299,051**	**$313,482**	**$225,295**
Variable Portion of Semi-Variable Expenses* **	**$149,526**	**$156,741**	**$112,648**
Profit Contribution Dollars	**$172,870**	**$114,552**	**$141,733**
Retail Vehicles Sold/Leased	**203.0**	**206.6**	**163.0**
Profit Contribution per Retail Vehicle Sold/Leased	**$852**	**$554**	**$870**

* VW Cost of Sales Adjustment LIFO calculated from Ratio of Used Volkswagen to Used Vehicle Department Retail Vehicle Cost of Goods Sold.

** Additions to Income consists of License & Documentary Fees.

*** Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
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Volkswagen Service + Volkswagen Parts & Accessories Department Profit Contribution
Northeast Region Average Dealer
2013 - 9/2015

Line Item	2013	2014	9/2015 YTD
Gross Profit - Service	841,606	900,197	746,868
Gross Profit Before Cost of Sales Adjustment LIFO (a) - P&A	518,911	565,623 (b)	440,985
Additions to Income (c)	9,476	0	0
Gross Profit Sum	**$1,369,993**	**$1,465,820**	**$1,187,853**
Variable Selling Expenses	**$114,141**	**$116,583**	**$85,700**
Total Employment Expenses	828,945	858,767	625,555
LESS: Salaries - Owners	(39,141)	(40,146)	(27,113)
Total Semi-Fixed Expenses	274,206	282,673	197,646
LESS: Other Depreciable Assets - Expenses	(1,589)	(1,573)	(1,306)
Semi-Variable Expenses	**$1,062,421**	**$1,099,721**	**$794,782**
Variable Portion of Semi-Variable Expenses (d)	**$531,211**	**$549,861**	**$397,391**
Profit Contribution Dollars	**$724,641**	**$799,376**	**$704,762**
Volkswagen Service + Volkswagen P&A Sales	**$3,011,786**	**$3,241,415**	**$2,582,248**
Profit Contribution per $1,000 of Sales	**$241**	**$247**	**$273**

(a) Sum of VW Line items broken out on the P&A Department Gross Profit Detail.
(b) Calculated from 9/2014 Plus Q4 2014.
(c) Additions to Income consists of VW Parts Achievement Bonus.
(d) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
F:\VWDB: PCVWNER.XLSX:SNEW:73:TKHLHL

New Volkswagen Vehicle Department Profit Contribution
Pacific Region Average Dealer
2013 - 9/2015

Line Item	2013	2014 (a)	9/2015 YTD	
Gross Profit Including Cost of Sales Adjustment LIFO	925,764	1,280,991	1,272,695	
Reversal of VW Cost of Sales Adjustment LIFO (b)	16,785	11,305	872	(c)
Additions to Income (d)	1,024,115	175,348	52,275	
Gross Profit Sum	**$1,966,664**	**$1,467,644**	**$1,325,842**	
Variable Selling Expenses	**$690,798**	**$593,828**	**$454,158**	
Total Employment Expenses	721,213	650,396	543,326	
LESS: Salaries - Owners	(30,479)	(28,484)	(22,598)	
Total Semi-Fixed Expenses	192,132	186,281	146,995	
LESS: Other Depreciable Assets - Expenses	(188)	(865)	(764)	
Semi-Variable Expenses	**$882,678**	**$807,328**	**$666,959**	
Variable Portion of Semi-Variable Expenses (e)	**$441,339**	**$403,664**	**$333,480**	
Profit Contribution Dollars	**$834,527**	**$470,152**	**$538,204**	
Retail Vehicles Sold/Leased	**708.0**	**574.4**	**457.4**	**(c)**
Profit Contribution per Retail Vehicle Sold/Leased	**$1,179**	**$819**	**$1,177**	

(a) Calculated from 9/2014 YTD Plus Q4 2014.
(b) VW Cost of Sales Adjustment LIFO calculated based on New Volkswagen share of New Vehicle Department Retail Vehicle Cost of Goods Sold.
(c) Calculated from 2015 Less Q4 2015.
(d) Additions to Income consists of License & Documentary Fees, VW Performance Bonus, Holdback/Transaction Credit, VW MDO Bonus, and IDM Funds Received.
(e) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015.
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Used Volkswagen Vehicle Department Profit Contribution
Pacific Region Average Dealer
2013 - 9/2015

Line Item	2013	2014 (a)	9/2015 YTD	
Gross Profit Including Cost of Sales Adjustment LIFO	826,418	728,107	634,811	
Reversal of VW Cost of Sales Adjustment LIFO (b)	(426)	422	57	(c)
Additions to Income (d)	32,512	32,138	27,601	
Gross Profit Sum	**$858,504**	**$760,667**	**$662,469**	
Variable Selling Expenses	**$394,635**	**$362,825**	**$281,754**	
Total Employment Expenses	408,173	380,856	311,708	
LESS: Salaries - Owners	(18,643)	(16,705)	(13,144)	
Total Semi-Fixed Expenses	114,539	114,145	91,039	
LESS: Other Depreciable Assets - Expenses	(106)	(762)	(522)	
Semi-Variable Expenses	**$503,963**	**$477,534**	**$389,081**	
Variable Portion of Semi-Variable Expenses (e)	**$251,982**	**$238,767**	**$194,541**	
Profit Contribution Dollars	**$211,887**	**$159,075**	**$186,174**	
Retail Vehicles Sold/Leased	**285.0**	**281.2**	**241.5**	**(c)**
Profit Contribution per Retail Vehicle Sold/Leased	**$743**	**$566**	**$771**	

(a) Calculated from 9/2014 YTD Plus Q4 2014.
(b) VW Cost of Sales Adjustment LIFO calculated from Ratio of Used Volkswagen to Used Vehicle Department Retail Vehicle Cost of Goods Sold.
(c) Calculated from 2015 Less Q4 2015.
(d) Additions to Income consists of License & Documentary Fees.
(e) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015.
F:\VWDB: PCVWPAR.XLSX:SUSE:73:TKHLHL

Volkswagen Service + Volkswagen Parts & Accessories Department Profit Contribution
Pacific Region Average Dealer
2013 - 9/2015

Line Item	2013	2014 (a)	9/2015 YTD	
Gross Profit - Service	1,343,188	1,291,096	1,137,873	
Gross Profit Before Cost of Sales Adjustment LIFO (b) - P&A	757,466	724,820	585,248	(c)
Additions to Income (d)	16,389	0	0	
Gross Profit Sum	**$2,117,043**	**$2,015,916**	**$1,723,121**	
Variable Selling Expenses	**$152,379**	**$133,166**	**$101,864**	
Total Employment Expenses	1,212,657	1,100,130	905,401	
LESS: Salaries - Owners	(38,587)	(33,472)	(27,691)	
Total Semi-Fixed Expenses	362,743	327,685	253,103	
LESS: Other Depreciable Assets - Expenses	(802)	(1,242)	(1,042)	
Semi-Variable Expenses	**$1,536,011**	**$1,393,101**	**$1,129,771**	
Variable Portion of Semi-Variable Expenses(e)	**$768,006**	**$696,551**	**$564,886**	
Profit Contribution Dollars	**$1,196,658**	**$1,186,199**	**$1,056,371**	
Volkswagen Service + Volkswagen P&A Sales	**$4,448,139**	**$4,255,261**	**$3,565,930**	
Profit Contribution per $1,000 of Sales	**$269**	**$279**	**$296**	

(a) Calculated from 9/2014 YTD Plus Q4 2014.
(b) Sum of VW Line items broken out on the P&A Department Gross Profit Detail.
(c) Calculated from 2015 Less Q4 2015.
(d) Additions to Income consists of VW Parts Achievement Bonus.
(e) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015.
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New Volkswagen Vehicle Department Profit Contribution
South Central Region Average Dealer
2013 - 9/2015

Line Item	2013	2014		9/2015 YTD
Gross Profit Including Cost of Sales Adjustment LIFO	960,685	1,154,419		979,593
Reversal of VW Cost of Sales Adjustment LIFO (a)	15,112	11,426	(b)	1,201
Additions to Income (c)	819,747	147,632		48,538
Gross Profit Sum	**$1,795,544**	**$1,313,477**		**$1,029,332**
Variable Selling Expenses	**$686,177**	**$602,240**		**$432,515**
Total Employment Expenses	582,576	552,707		419,048
LESS: Salaries - Owners	(24,609)	(24,302)		(20,051)
Total Semi-Fixed Expenses	191,674	184,748		137,274
LESS: Other Depreciable Assets - Expenses	(667)	(676)		(984)
Semi-Variable Expenses	**$748,974**	**$712,477**		**$535,287**
Variable Portion of Semi-Variable Expenses (d)	**$374,487**	**$356,239**		**$267,644**
Profit Contribution Dollars	**$734,880**	**$354,998**		**$329,173**
Retail Vehicles Sold/Leased	**593.0**	**484.3**	(b)	**361.3**
Profit Contribution per Retail Vehicle Sold/Leased	**$1,239**	**$733**		**$911**

(a) VW Cost of Sales Adjustment LIFO calculated based on New Volkswagen share of New Vehicle Department Retail Vehicle Cost of Goods Sold.
(b) Calculated from 9/2014 YTD Plus Q4 2014.
(c) Additions to Income consists of License & Documentary Fees, VW Performance Bonus, Holdback/Transaction Credit, VW MDO Bonus, and IDM Funds Received.
(d) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
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Used Volkswagen Vehicle Department Profit Contribution
South Central Region Average Dealer
2013 - 9/2015

Line Item	2013	2014		9/2015 YTD
Gross Profit Including Cost of Sales Adjustment LIFO	792,130	685,110		542,980
Reversal of VW Cost of Sales Adjustment LIFO (a)	55	258	(b)	83
Additions to Income (c)	29,486	27,999		27,272
Gross Profit Sum	**$821,671**	**$713,367**		**$570,335**
Variable Selling Expenses	**$383,580**	**$403,534**		**$299,362**
Total Employment Expenses	368,909	368,159		280,884
LESS: Salaries - Owners	(17,347)	(20,062)		(12,587)
Total Semi-Fixed Expenses	127,966	131,095		99,269
LESS: Other Depreciable Assets - Expenses	(276)	(459)		(960)
Semi-Variable Expenses	**$479,252**	**$478,733**		**$366,606**
Variable Portion of Semi-Variable Expenses (d)	**$239,626**	**$239,367**		**$183,303**
Profit Contribution Dollars	**$198,465**	**$70,466**		**$87,670**
Retail Vehicles Sold/Leased	**267.0**	**243.6**	(b)	**203.0**
Profit Contribution per Retail Vehicle Sold/Leased	**$743**	**$289**		**$432**

(a) VW Cost of Sales Adjustment LIFO calculated from Ratio of Used Volkswagen to Used Vehicle Department Retail Vehicle Cost of Goods Sold.
(b) Calculated from Q4 2014 Plus 9/2014 YTD.
(c) Additions to Income consists of License & Documentary Fees.
(d) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
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Volkswagen Service + Volkswagen Parts & Accessories Department Profit Contribution
South Central Region Average Dealer
2013 - 9/2015

Line Item	2013	2014 (a)	9/2015 YTD
Gross Profit - Service	1,005,200	955,027	811,236
Gross Profit Before Cost of Sales Adjustment LIFO (b) - P&A	659,512	622,220	485,410
Additions to Income (c)	9,987	0	0
Gross Profit Sum	**$1,674,699**	**$1,577,247**	**$1,296,646**
Variable Selling Expenses	**$115,048**	**$112,696**	**$87,530**
Total Employment Expenses	1,004,068	953,643	747,947
LESS: Salaries - Owners	(35,494)	(32,900)	(24,469)
Total Semi-Fixed Expenses	314,602	305,327	239,374
LESS: Other Depreciable Assets - Expenses	(1,689)	(1,659)	(1,952)
Semi-Variable Expenses	**$1,281,487**	**$1,224,411**	**$960,900**
Variable Portion of Semi-Variable Expenses(d)	**$640,744**	**$612,206**	**$480,450**
Profit Contribution Dollars	**$918,907**	**$852,345**	**$728,666**
Volkswagen Service + Volkswagen P&A Sales	**$3,643,560**	**$3,463,538**	**$2,808,015**
Profit Contribution per $1,000 of Sales	**$252**	**$246**	**$259**

(a) Calculated from Q4 2014 Plus 9/2014 YTD.
(b) Sum of VW Line items broken out on the P&A Department Gross Profit Detail.
(c) Additions to Income consists of VW Parts Achievement Bonus.
(d) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
F:\VWDB: PCVWSCR.XLSX:SFIX:73:TKHLHL

New Volkswagen Vehicle Department Profit Contribution
Southeast Region Average Dealer
2013 - 9/2015

Line Item	2013	2014		9/2015 YTD
Gross Profit Including Cost of Sales Adjustment LIFO	697,645	858,581		801,400
Reversal of VW Cost of Sales Adjustment LIFO (a)	18,306	12,531	(b)	275
Additions to Income (c)	890,204	291,510		153,647
Gross Profit Sum	**$1,606,155**	**$1,162,622**		**$955,322**
Variable Selling Expenses	**$590,485**	**$575,865**		**$394,701**
Total Employment Expenses	606,398	587,841		444,884
LESS: Salaries - Owners	(35,039)	(35,941)		(31,155)
Total Semi-Fixed Expenses	204,714	207,372		146,186
LESS: Other Depreciable Assets - Expenses	(1,044)	(888)		(2,127)
Semi-Variable Expenses	**$775,029**	**$758,384**		**$557,788**
Variable Portion of Semi-Variable Expenses (d)	**$387,515**	**$379,192**		**$278,894**
Profit Contribution Dollars	**$628,155**	**$207,565**		**$281,727**
Retail Vehicles Sold/Leased	**614.0**	**538.9**	(b)	**391.4**
Profit Contribution per Retail Vehicle Sold/Leased	**$1,023**	**$385**		**$720**

(a) VW Cost of Sales Adjustment LIFO calculated based on New Volkswagen share of New Vehicle Department Retail Vehicle Cost of Goods Sold.
(b) Calculated from 9/2014 YTD Plus Q4 2014.
(c) Additions to Income consists of License & Documentary Fees, VW Performance Bonus, Holdback/Transaction Credit, VW MDO Bonus, and IDM Funds Received.
(d) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
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Used Volkswagen Vehicle Department Profit Contribution
Southeast Region Average Dealer
2013 - 9/2015

Line Item	2013	2014		9/2015 YTD
Gross Profit Including Cost of Sales Adjustment LIFO	628,600	497,890		351,708
Reversal of VW Cost of Sales Adjustment LIFO (a)	31,744	24,181	(b)	16,890
Additions to Income (c)	77,402	86,254		77,569
Gross Profit Sum	**$737,746**	**$608,325**		**$446,167**
Variable Selling Expenses	**$344,530**	**$321,477**		**$222,291**
Total Employment Expenses	304,577	300,531		229,991
LESS: Salaries - Owners	(10,636)	(12,932)		(10,722)
Total Semi-Fixed Expenses	105,215	110,323		81,399
LESS: Other Depreciable Assets - Expenses	(578)	(334)		(1,027)
Semi-Variable Expenses	**$398,578**	**$397,588**		**$299,641**
Variable Portion of Semi-Variable Expenses (d)	**$199,289**	**$198,794**		**$149,821**
Profit Contribution Dollars	**$193,927**	**$88,054**		**$74,055**
Retail Vehicles Sold/Leased	**252.0**	**244.2**	(b)	**197.6**
Profit Contribution per Retail Vehicle Sold/Leased	**$770**	**$361**		**$375**

(a) VW Cost of Sales Adjustment LIFO calculated from Ratio of Used Volkswagen to Used Vehicle Department Retail Vehicle Cost of Goods Sold.
(b) Calculated from Q4 2014 Plus 9/2014 YTD.
(c) Additions to Income consists of License & Documentary Fees.
(d) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
F:\VWDB: PCVWSER.XLSX:SUSE:73:TKHLHL

Volkswagen Service + Volkswagen Parts & Accessories Department Profit Contribution
Southeast Region Average Dealer
2013 - 9/2015

Line Item	2013	2014 (a)	9/2015 YTD
Gross Profit - Service	1,139,833	1,143,024	934,780
Gross Profit Before Cost of Sales Adjustment LIFO (b) - P&A	703,893	725,892	560,029
Additions to Income (c)	10,492	0	0
Gross Profit Sum	**$1,854,218**	**$1,868,916**	**$1,494,809**
Variable Selling Expenses	**$144,118**	**$138,070**	**$100,078**
Total Employment Expenses	995,517	968,920	740,715
LESS: Salaries - Owners	(27,276)	(29,078)	(23,903)
Total Semi-Fixed Expenses	305,256	307,270	225,795
LESS: Other Depreciable Assets - Expenses	(2,120)	(1,656)	(3,532)
Semi-Variable Expenses	**$1,271,377**	**$1,245,456**	**$939,075**
Variable Portion of Semi-Variable Expenses (d)	**$635,689**	**$622,728**	**$469,538**
Profit Contribution Dollars	**$1,074,411**	**$1,108,118**	**$925,193**
Volkswagen Service + Volkswagen P&A Sales	**$3,923,504**	**$4,019,220**	**$3,199,976**
Profit Contribution per $1,000 of Sales	**$274**	**$276**	**$289**

(a) Calculated from Q4 2014 Plus 9/2014 YTD.
(b) Sum of VW Line items broken out on the P&A Department Gross Profit Detail.
(c) Additions to Income consists of VW Parts Achievement Bonus.
(d) Variable portion of Semi-Variable Expenses is 50%.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 9/2015.
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Lost New Volkswagen TDI Sales
U.S. Volkswagen Dealers
9/2015 - 2025

	(1)	(2)	(3) (1) Monthly Avg * No. of Months in Period	(4) (2) Monthly Avg * No. of Months in Period	(5) (3) + (4) - (1) - (2)
	New Volkswagen TDI Sales (Excluding Touareg)	**New Touareg TDI Sales**	**Predicted New Volkswagen TDI Sales (Excluding Touareg)**	**Predicted New Touareg TDI Sales**	**Lost New TDI Sales**
2013	91,974	3,454			
2014	75,863	2,972			
8/2015 YTD	48,471				
10/2015 YTD		2,309			
Monthly Average	6,760	257			
9/2015 - 12/2015	2,694		27,040		24,346
11/2015 - 12/2015		50		514	464
2016			81,120	3,084	84,204
2017			81,120	3,084	84,204
2018			81,120	3,084	84,204
2019			81,120	3,084	84,204
2020			81,120	3,084	84,204
2021			81,120	3,084	84,204
2022			81,120	3,084	84,204
2023			81,120	3,084	84,204
2024			81,120	3,084	84,204
2025			81,120	3,084	84,204

SOURCE: The Fontana Group, Inc.
DATA: Manufacturer RDR Data Files (Magnetic Media).
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Estimated Returning Customer Offset
with 37% Brand Loyalty and 6-Year Lag
U.S.
9/2015 - 2025

Prior Year	(1) Prior Year New Volkswagen TDI Sales (a)	(2) Estimated Offset for Brand Loyalty	Current Period	(3) (1) * (2) Current Period Returning Customer Offset	Current Period	(4) (2) * (3) Current Period Returning Customer Offset
2009	41,278	37%	**2015**	5,091 (b)	**2021**	1,884
2010	56,503	37%	**2016**	20,906	**2022**	7,735
2011	70,071	37%	**2017**	25,926	**2023**	9,593
2012	90,054	37%	**2018**	33,320	**2024**	12,328
2013	95,428	37%	**2019**	35,308	**2025**	13,064
2014	78,835	37%	**2020**	29,169		
2015	53,524	37%	**2021**	19,804		

(a) 2010 uses 22% of Total New Volkswagen Sales (256,830);
2011 uses 21.6% of Total New Volkswagen Sales (324,402).
(b) 9/2015 - 12/2015 amount prorated by 4 months.

SOURCE: The Fontana Group, Inc.
DATA: Manufacturer RDR Data Files (Magnetic Media).
"Volkswagen of America Announces December Sales and 2009 Annual Sales" Article, 1/5/2010.
"Volkswagen of America Closes 2010 With Best Overall Year Sales Since 2003" Article, 1/4/2011.
"Volkswagen Reports 26.3 Percent Increase in 2011 U.S. Sales" Article, 1/4/2012.
Edmunds Loyalty Report, 2018.
"Americans holding onto their cars longer than ever" Article, 7/28/2015.
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Lost New Volkswagen TDI Sales with 37% Returning Customer Offset U.S. 9/2015 - 2025

	(1) Lost New TDI Sales	(2) 37% Returning Customer Offset	(3) (1) - (2) Lost New TDI Sales with 37% Returning Customer Offset
9/2015 - 12/2015	24,810	5,091	19,719
2016	84,204	20,906	63,298
2017	84,204	25,926	58,278
2018	84,204	33,320	50,884
2019	84,204	35,308	48,896
2020	84,204	29,169	55,035
2021	84,204	21,688	62,516
2022	84,204	7,735	76,469
2023	84,204	9,593	74,611
2024	84,204	12,328	71,876
2025	84,204	13,064	71,140

SOURCE: The Fontana Group, Inc.
DATA: Manufacturer RDR Data Files (Magnetic Media).
"Volkswagen of America Announces December Sales and 2009 Annual Sales" Article, 1/5/2010.
"Volkswagen of America Closes 2010 With Best Overall Year Sales Since 2003" Article, 1/4/2011.
"Volkswagen Reports 26.3 Percent Increase in 2011 U.S. Sales" Article, 1/4/2012.
Edmunds Loyalty Report, 2018.
"Americans holding onto their cars longer than ever" Article, 7/28/2015.
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Lost New Volkswagen TDI Sales with 37% Returning Customer Offset Adjusted for Change in Competitive Registrations
U.S.
9/2015 - 2025

	(1)	(2) See Note	(3) (1) * (2)
	Lost New TDI Sales with 37% Returning Customer Offset	**Adjustment for Change in Competitive Registrations**	**Lost New TDI Sales with 37% Returning Customer Offset Adjusted for Change in Competitive Registrations**
9/2015 - 12/2015	19,719	0.942	18,585
2016	63,298	0.926	58,606
2017	58,278	0.891	51,914
2018	50,884	0.807	41,057
2019	48,896	0.807 *	39,453
2020	55,035	0.807 *	44,406
2021	62,516	0.807 *	50,442
2022	76,469	0.807 *	61,701
2023	74,611	0.807 *	60,201
2024	71,876	0.807 *	57,995
2025	71,140	0.807 *	57,401

* 2019 - 2025 use 2018 value.

NOTE: Competitive Registrations include IHS Segments with more than 1 Volkswagen TDI Registration in the U.S. from 2013 - 8/2015. Figures in Column (2) are shown rounded but are unrounded in their application.

SOURCE: The Fontana Group, Inc.
DATA: Manufacturer RDR Data Files (Magnetic Media).
"Volkswagen of America Announces December Sales and 2009 Annual Sales" Article, 1/5/2010.
"Volkswagen of America Closes 2010 With Best Overall Year Sales Since 2003" Article, 1/4/2011.
"Volkswagen Reports 26.3 Percent Increase in 2011 U.S. Sales" Article, 1/4/2012.
Edmunds Loyalty Report, 2018.
"Americans holding onto their cars longer than ever" Article, 7/28/2015.
IHS Automotive, 2013 (9/2018 Update).
IHS Automotive, 2014 - 2015 (10/2018 Update).
IHS Automotive, 2016 - 2018 (3/2019 Update).
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Reduced Lost New Volkswagen TDI Sales with 37% Returning Customer Offset Adjusted for Change in Competitive Registrations
U.S.
9/2015 - 2025

	(1) Lost New TDI Sales with 37% Returning Customer Offset Adjusted for Change in Competitive Registrations	(2) Reduction	(3) Reduced Lost New TDI Sales with 37% Returning Customer Offset Adjusted for Change in Competitive Registrations
9/2015 - 12/2015	18,585	6.39%	17,397
2016	58,606	6.39%	54,861
2017	51,914	6.39%	48,597
2018	41,057	6.39%	38,433
2019	39,453	14.29%	33,817
2020	44,406	28.57%	31,719
2021	50,442	42.86%	28,824
2022	61,701	57.14%	26,443
2023	60,201	71.43%	17,200
2024	57,995	85.71%	8,285
2025	57,401	100.00%	0

NOTE: 9/2015 - 2018 lost sales are reduced 6.39%.
Beginning in 2019, lost sales are reduced until fully eliminated in 2025 (2019 reduction = 1/7, 2020 reduction = 2/7, etc.).

SOURCE: The Fontana Group, Inc.
DATA: Manufacturer RDR Data Files (Magnetic Media).
"Volkswagen of America Announces December Sales and 2009 Annual Sales" Article, 1/5/2010.
"Volkswagen of America Closes 2010 With Best Overall Year Sales Since 2003" Article, 1/4/2011.
"Volkswagen Reports 26.3 Percent Increase in 2011 U.S. Sales" Article, 1/4/2012.
Edmunds Loyalty Report, 2018.
"Americans holding onto their cars longer than ever" Article, 7/28/2015.
IHS Automotive, 2013 (9/2018 Update).
IHS Automotive, 2014 - 2015 (10/2018 Update).
IHS Automotive, 2016 - 2018 (3/2019 Update).
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Lost Profit Due to Reduced Lost New TDI Sales with 37% Returning Customer Offset Adjusted for Change in Competitive Registrations New Volkswagen Retail Vehicle Department U.S. Volkswagen Dealers 9/2015 - 2024

	(1) Reduced Lost New TDI Sales	(2) Profit Contribution per Retail Unit Sold*	(3) (1) * (2) Lost Profit
9/2015 - 12/2015	17,397	$939	$16,335,783
2016	54,861	$954	$52,337,394
2017	48,597	$954	$46,361,538
2018	38,433	$954	$36,665,082
2019	33,817	$954	$32,261,418
2020	31,719	$954	$30,259,926
2021	28,824	$954	$27,498,096
2022	26,443	$954	$25,226,622
2023	17,200	$954	$16,408,800
2024	8,285	$954	$7,903,890

* 9/2015 - 12/2015 uses 9/2015 YTD value; 2016 - 2024 uses 2013 - 9/2015 average. All figures are in 2018 dollars.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015.
Manufacturer RDR Data Files (Magnetic Media).
Bureau of Economic Analysis Internet Site, 3/28/2019.
"Volkswagen of America Announces December Sales and 2009 Annual Sales" Article, 1/5/2010.
"Volkswagen of America Closes 2010 With Best Overall Year Sales Since 2003" Article, 1/4/2011.
"Volkswagen Reports 26.3 Percent Increase in 2011 U.S. Sales" Article, 1/4/2012.
Edmunds Loyalty Report, 2018.
"Americans holding onto their cars longer than ever" Article, 7/28/2015.
IHS Automotive, 2013 (9/2018 Update).
IHS Automotive, 2014 - 2015 (10/2018 Update).
IHS Automotive, 2016 - 2018 (3/2019 Update).
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Lost Profit Due to Reduced Lost New TDI Sales
with 37% Returning Customer Offset
Adjusted for Change in Competitive Registrations
Used Vehicle Department
U.S. Volkswagen Dealers
9/2015 - 2024

	(1)	(2)	(3) (1) * (2)	(4)	(5) (3) * (4)
	Reduced Lost New TDI Sales	U.S. Volkswagen Dealers Used Retail Sales Originating from a New or Prior New Trade-In % New Retail Sales	Lost Used Sales	Profit Contribution per Retail Unit Sold*	Lost Profit
9/2015 - 12/2015	17,397	37.6%	6,541	$632	$4,133,912
2016	54,861	37.6%	20,628	$684	$14,109,552
2017	48,597	37.6%	18,272	$684	$12,498,048
2018	38,433	37.6%	14,451	$684	$9,884,484
2019	33,817	37.6%	12,715	$684	$8,697,060
2020	31,719	37.6%	11,926	$684	$8,157,384
2021	28,824	37.6%	10,838	$684	$7,413,192
2022	26,443	37.6%	9,943	$684	$6,801,012
2023	17,200	37.6%	6,467	$684	$4,423,428
2024	8,285	37.6%	3,115	$684	$2,130,660

* 9/2015 - 12/2015 uses 9/2015 YTD value; 2016 - 2024 uses 2013 - 9/2015 average. All figures are in 2018 dollars.

SOURCE: The Fontana Group, Inc.
DATA: Manufacturer RDR Data Files (Magnetic Media).
Bureau of Economic Analysis Internet Site, 3/28/2019.
"Volkswagen of America Announces December Sales and 2009 Annual Sales" Article, 1/5/2010.
"Volkswagen of America Closes 2010 With Best Overall Year Sales Since 2003" Article, 1/4/2011.
"Volkswagen Reports 26.3 Percent Increase in 2011 U.S. Sales" Article, 1/4/2012.
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IHS Automotive, 2013 (9/2018 Update).
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IHS Automotive, 2016 - 2018 (3/2019 Update).
NADA Data, 2015.
Composite Financial Reports, 2013 - 2015.
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Estimated Lost Volkswagen TDI 6-Year UIOs Due to Reduced Lost New TDI Sales with 37% Returning Customer Offset Adjusted for Change in Competitive Registrations
U.S.
As of December 31st of 2016 - 2022

	(1)	(2)	(3) (1) * [1 - (2)] ^ Years Until Dec. 31, 2016	(4) (1) * [1 - (2)] ^ Years Until Dec. 31, 2017	(5) (1) * [1 - (2)] ^ Years Until Dec. 31, 2018	(6) (1) * [1 - (2)] ^ Years Until Dec. 31, 2019	(7) (1) * [1 - (2)] ^ Years Until Dec. 31, 2020	(8) (1) * [1 - (2)] ^ Years Until Dec. 31, 2021	(9) (1) * [1 - (2)] ^ Years Until Dec. 31, 2022
	Reduced Lost New TDI Sales	Estimated Annual Scrappage Rate	Estimated Lost Volkswagen TDI 6-Year UIOs as of Dec. 31st						
			2016	2017	2018	2019	2020	2021	2022
9/2015 - 12/2015	17,397	1.5%	17,136	16,879	16,626	16,376	16,131		
2016	54,861	1.5%	54,861	54,038	53,228	52,429	51,643	50,868	
2017	48,597	1.5%		48,597	47,868	47,150	46,443	45,746	45,060
2018	38,433	1.5%			38,433	37,857	37,289	36,729	36,178
2019	33,817	1.5%				33,817	33,310	32,810	32,318
2020	31,719	1.5%					31,719	31,243	30,775
2021	28,824	1.5%						28,824	28,392
2022	26,443	1.5%	—	—	—	—	—	—	26,443
Sum			71,997	119,514	156,155	187,629	216,535	226,220	199,166

SOURCE: The Fontana Group, Inc.
DATA: Manufacturer RDR Data Files (Magnetic Media).
"Volkswagen of America Announces December Sales and 2009 Annual Sales" Article, 1/5/2010.
"Volkswagen of America Closes 2010 With Best Overall Year Sales Since 2003" Article, 1/4/2011.
"Volkswagen Reports 26.3 Percent Increase in 2011 U.S. Sales" Article, 1/4/2012.
Edmunds Loyalty Report, 2018.
"Americans holding onto their cars longer than ever" Article, 7/28/2015.
IHS Automotive, 2013 (9/2018 Update).
IHS Automotive, 2014 - 2015 (10/2018 Update).
IHS Automotive, 2016 - 2018 (3/2019 Update).
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Estimated Lost Volkswagen TDI 6-Year UIOs Due to Reduced Lost New TDI Sales with 37% Returning Customer Offset Adjusted for Change in Competitive Registrations
U.S.
As of December 31st of 2023 - 2029

	(1)	(2)	(3) (1) * [1 - (2)] ^ Years Until Dec. 31, 2023	(4) (1) * [1 - (2)] ^ Years Until Dec. 31, 2024	(5) (1) * [1 - (2)] ^ Years Until Dec. 31, 2025	(6) (1) * [1 - (2)] ^ Years Until Dec. 31, 2026	(7) (1) * [1 - (2)] ^ Years Until Dec. 31, 2027	(8) (1) * [1 - (2)] ^ Years Until Dec. 31, 2028	(9) (1) * [1 - (2)] ^ Years Until Dec. 31, 2029
	Reduced Lost New TDI Sales	Estimated Annual Scrappage Rate	Estimated Lost Volkswagen TDI 6-Year UIOs as of Dec. 31st						
			2023	2024	2025	2026	2027	2028	2029
2018	38,433	1.5%	35,636						
2019	33,817	1.5%	31,833	31,356					
2020	31,719	1.5%	30,313	29,858	29,410				
2021	28,824	1.5%	27,966	27,546	27,133	26,726			
2022	26,443	1.5%	26,046	25,656	25,271	24,892	24,518		
2023	17,200	1.5%	17,200	16,942	16,688	16,438	16,191	15,948	
2024	8,285	1.5%	—	8,285	8,161	8,038	7,918	7,799	7,682
Sum			168,994	139,643	106,663	76,094	48,627	23,747	7,682

SOURCE: The Fontana Group, Inc.
DATA: Manufacturer RDR Data Files (Magnetic Media).
"Volkswagen of America Announces December Sales and 2009 Annual Sales" Article, 1/5/2010.
"Volkswagen of America Closes 2010 With Best Overall Year Sales Since 2003" Article, 1/4/2011.
"Volkswagen Reports 26.3 Percent Increase in 2011 U.S. Sales" Article, 1/4/2012.
Edmunds Loyalty Report, 2018.
"Americans holding onto their cars longer than ever" Article, 7/28/2015.
IHS Automotive, 2013 (9/2018 Update).
IHS Automotive, 2014 - 2015 (10/2018 Update).
IHS Automotive, 2016 - 2018 (3/2019 Update).
F:\VWDB: DMGSNA.XLSX:SUT2:73:TMTDHL:RTOHIHL:73

Lost Profit Due to Reduced Lost New TDI Sales
with 37% Returning Customer Offset
Adjusted for Change in Competitive Registrations
Service + Parts & Accessories Departments
U.S. Volkswagen Dealers
9/2015 - 2029

	(1)	(2)	(3) (1) * (2)	(4)	(5) (3) * (4) / $1,000
	Estimated Lost Volkswagen TDI 6-Year UIOs as of Dec. 31st	2015 Sales per 6-Year UIO*	Lost Sales Dollars	Profit Contribution per $1,000 of Sales**	Lost Profit
9/2015 - 12/2015	17,397	$1,218	$21,189,546	$278	$5,890,694
2016	71,997	$1,218	$87,692,346	$265	$23,238,472
2017	119,514	$1,218	$145,568,052	$265	$38,575,534
2018	156,155	$1,218	$190,196,790	$265	$50,402,149
2019	187,629	$1,218	$228,532,122	$265	$60,561,012
2020	216,535	$1,218	$263,739,630	$265	$69,891,002
2021	226,220	$1,218	$275,535,960	$265	$73,017,029
2022	199,166	$1,218	$242,584,188	$265	$64,284,810
2023	168,994	$1,218	$205,834,692	$265	$54,546,193
2024	139,643	$1,218	$170,085,174	$265	$45,072,571
2025	106,663	$1,218	$129,915,534	$265	$34,427,617
2026	76,094	$1,218	$92,682,492	$265	$24,560,860
2027	48,627	$1,218	$59,227,686	$265	$15,695,337
2028	23,747	$1,218	$28,923,846	$265	$7,664,819
2029	7,682	$1,218	$9,356,676	$265	$2,479,519

* Figure is in 2018 dollars.
** 9/2015 - 12/2015 uses 9/2015 YTD value; 2016 - 2029 uses average of 2013 - 9/2015.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 9/2015 YTD.
Manufacturer RDR Data Files (Magnetic Media).
Auto News, 2010 - 2015.
Bureau of Economic Analysis Internet Site, 3/28/2019.
"Volkswagen of America Announces December Sales and 2009 Annual Sales" Article, 1/5/2010.
"Volkswagen of America Closes 2010 With Best Overall Year Sales Since 2003" Article, 1/4/2011.
"Volkswagen Reports 26.3 Percent Increase in 2011 U.S. Sales" Article, 1/4/2012.
Edmunds Loyalty Report, 2018.
"Americans holding onto their cars longer than ever" Article, 7/28/2015.
IHS Automotive, 2013 (9/2018 Update).
IHS Automotive, 2014 - 2015 (10/2018 Update).
IHS Automotive, 2016 - 2018 (3/2019 Update).
F:\VWDB: DMGSNA.XLSX:SSP:73:TMTDHL:RTOHIHL:73

Lost Profit Due to Reduced Lost New TDI Sales with 37% Returning Customer Offset Adjusted for Change in Competitive Registrations Total Dealership U.S. Volkswagen Dealers 9/2015 - 2029

	(1)	(2)	(3)	(4) (1) + (2) + (3)
	Lost Profit by Department*			
	New Volkswagen Retail Vehicle Department	Used Vehicle Department	Service + Parts & Accessories Departments	Total Dealership
9/2015 - 12/2015	$16,335,783	$4,133,912	$5,890,694	$26,360,389
2016	$52,337,394	$14,109,552	$23,238,472	$89,685,418
2017	$46,361,538	$12,498,048	$38,575,534	$97,435,120
2018	$36,665,082	$9,884,484	$50,402,149	$96,951,715
2019	$32,261,418	$8,697,060	$60,561,012	$101,519,490
2020	$30,259,926	$8,157,384	$69,891,002	$108,308,312
2021	$27,498,096	$7,413,192	$73,017,029	$107,928,317
2022	$25,226,622	$6,801,012	$64,284,810	$96,312,444
2023	$16,408,800	$4,423,428	$54,546,193	$75,378,421
2024	$7,903,890	$2,130,660	$45,072,571	$55,107,121
2025			$34,427,617	$34,427,617
2026			$24,560,860	$24,560,860
2027			$15,695,337	$15,695,337
2028			$7,664,819	$7,664,819
2029			$2,479,519	$2,479,519

* All figures are in 2018 dollars.

SOURCE: The Fontana Group, Inc.
DATA: Manufacturer RDR Data Files (Magnetic Media).
Auto News, 2010 - 2015.
"Volkswagen of America Announces December Sales and 2009 Annual Sales" Article, 1/5/2010.
"Volkswagen of America Closes 2010 With Best Overall Year Sales Since 2003" Article, 1/4/2011.
"Volkswagen Reports 26.3 Percent Increase in 2011 U.S. Sales" Article, 1/4/2012.
Edmunds Loyalty Report, 2018.
"Americans holding onto their cars longer than ever" Article, 7/28/2015.
Bureau of Economic Analysis Internet Site, 3/28/2019.
IHS Automotive, 2013 (9/2018 Update).
IHS Automotive, 2014 - 2015 (10/2018 Update).
IHS Automotive, 2016 - 2018 (3/2019 Update).
NADA Data, 2015.
Composite Financial Reports, 2013 - 2015.
F:\VWDB: DMGSNA.XLSX:SLP:73:TMTDHL:RTOHIHL:73

Present Value of Lost Profit
Due to Reduced Lost New TDI Sales
with 37% Returning Customer Offset
Adjusted for Change in Competitive Registrations
U.S. Volkswagen Dealers
9/2015 - 2029

	(1)	(2)	(3) (1) * (2)
	Lost Profit*	Dec. 31, 2018 PVDF	Present Value of Lost Profit
9/2015 - 12/2015	$26,360,389		$26,360,389
2016	$89,685,418		$89,685,418
2017	$97,435,120		$97,435,120
2018	$96,951,715	1.000	$96,951,715
2019	$101,519,490	0.883	$89,641,710
2020	$108,308,312	0.780	$84,480,483
2021	$107,928,317	0.661	$71,340,618
2022	$96,312,444	0.560	$53,934,969
2023	$75,378,421	0.475	$35,804,750
2024	$55,107,121	0.403	$22,208,170
2025	$34,427,617	0.342	$11,774,245
2026	$24,560,860	0.290	$7,122,649
2027	$15,695,337	0.246	$3,861,053
2028	$7,664,819	0.209	$1,601,947
2029	$2,479,519	0.177	$438,875
		Sum:	$692,642,111

* All figures are in 2018 dollars.

SOURCE: The Fontana Group, Inc.
DATA: Manufacturer RDR Data Files (Magnetic Media).
Auto News, 2010 - 2015.
"Volkswagen of America Announces December Sales and 2009 Annual Sales" Article, 1/5/2010.
"Volkswagen of America Closes 2010 With Best Overall Year Sales Since 2003" Article, 1/4/2011.
"Volkswagen Reports 26.3 Percent Increase in 2011 U.S. Sales" Article, 1/4/2012.
Edmunds Loyalty Report, 2018.
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Bureau of Economic Analysis Internet Site, 3/28/2019.
Valuation Handbook, Guide to Cost of Capital, 2016.
Valuation Handbook, Industry Cost of Capital, 3/2016.
IHS Automotive, 2013 (9/2018 Update).
IHS Automotive, 2014 - 2015 (10/2018 Update).
IHS Automotive, 2016 - 2018 (3/2019 Update).
NADA Data, 2015.
Composite Financial Reports, 2013 - 2015.
F:\VWDB: DMGSNA.XLSX:SPV:73:TMTDHL:RTOHIHL:73

Estimated Volkswagen TDI 6-Year UIOs without Buyback
U.S.
As of December 31st of 2017 - 2020

	(1)	(2)	(3) (1) * [1 - (2)] ^ Years Until Dec. 31, 2017	(4) (1) * [1 - (2)] ^ Years Until Dec. 31, 2018	(5) (1) * [1 - (2)] ^ Years Until Dec. 31, 2019	(6) (1) * [1 - (2)] ^ Years Until Dec. 31, 2020
	Dealers' New Volkswagen TDI Sales	Estimated Annual Scrappage Rate	Estimated Volkswagen TDI 6-Year UIOs as of Dec. 31st 2017	2018	2019	2020
2012	90,054	1.5%	83,500			
2013	95,428	1.5%	89,830	88,482		
2014	78,835	1.5%	75,340	74,210	73,097	
2015	53,524	1.5%	51,930	51,151	50,384	49,628
Sum			300,600	213,843	123,481	49,628

SOURCE: The Fontana Group, Inc.
DATA: Manufacturer RDR Data Files (Magnetic Media).
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Lost Sales Dollars After Buyback
Volkswagen Service + Parts & Accessories Departments
U.S. Volkswagen Dealers
2017 - 2020

	(1)	(2) (1) * 78.3%	(3)	(4) (2) * (3)	
	Estimated Volkswagen TDI 6-Year UIOs as of Dec. 31st	**Lost Share of Volkswagen TDI 6-Year UIOs After Buyback**	**2015 Sales per 6-Year UIO (in 2018 $s)**	**Lost Sales Dollars (in 2018 $s)**	
2017	300,600	235,370	$1,218	$215,010,495	*
2018	213,843	167,439	$1,218	$203,940,702	
2019	123,481	96,686	$1,218	$117,763,548	
2020	49,628	38,859	$1,218	$47,330,262	

* 2017 prorated to 9 months to account for average buyback date of 3/31/2017.

SOURCE: The Fontana Group, Inc
DATA: Manufacturer RDR Data Files (Magnetic Media)
Auto News, 2010 - 2015
Claims Supervisor Report, 11/26/2018
Claims Supervisor Report, 12/13/2018
Composite Financial Reports, 9/2015 YTD
Bureau of Economic Analysis Internet Site, 3/28/2019
F:\VWDB: DMGSNA XLSX:SLFA:73:TOTOHL

Lost Profit After Buyback
Volkswagen Service + Parts & Accessories Departments
U.S. Volkswagen Dealers
2017 - 2020

	(1)	(2)	(3) (1) * (2) / $1,000
	Lost Sales Dollars (in 2018 $s)	**Profit Contribution per $1,000 of Sales***	**Lost Profit (in 2018 $s)**
2017	$215,010,495	$265	$56,977,781
2018	$203,940,702	$265	$54,044,286
2019	$117,763,548	$265	$31,207,340
2020	$47,330,262	$265	$12,542,519
		Sum:	$154,771,926

* Figure represents average of 2013 - 9/2015.

SOURCE: The Fontana Group, Inc
DATA: Manufacturer RDR Data Files (Magnetic Media).
Auto News, 2010 - 2015.
Claims Supervisor Report, 11/26/2018.
Claims Supervisor Report, 12/13/2018.
Composite Financial Reports, 2013 - 2015.
Bureau of Economic Analysis Internet Site, 3/28/2019.
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Vehicles Removed from Market as a Percent of Subject Vehicles After Scrappage

	Subject Vehicles After Scrappage	Volkswagen Subject Vehicles After Scrappage*	Volkswagen Vehicles Removed from Market	Volkswagen Vehicles Removed from Market % Subject Vehicles After Scrappage
2.0 Liter TDI Vehicles	486,278	486,278	380,507	
3.0 Liter TDI Vehicles	19,343	9,826	8,101	
Sum		496,104	388,608	78.3%

* Assumes 50.8% of 3.0 Liter TDI Vehicles are Volkswagens. All 2.0 Liter TDI Vehicles are Volkswagens.

SOURCE: The Fontana Group, Inc.
DATA: Claims Supervisor Report, 11/26/2018.
Claims Supervisor Report, 12/13/2018.
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Potential Mitigation of Lost New TDI Sales

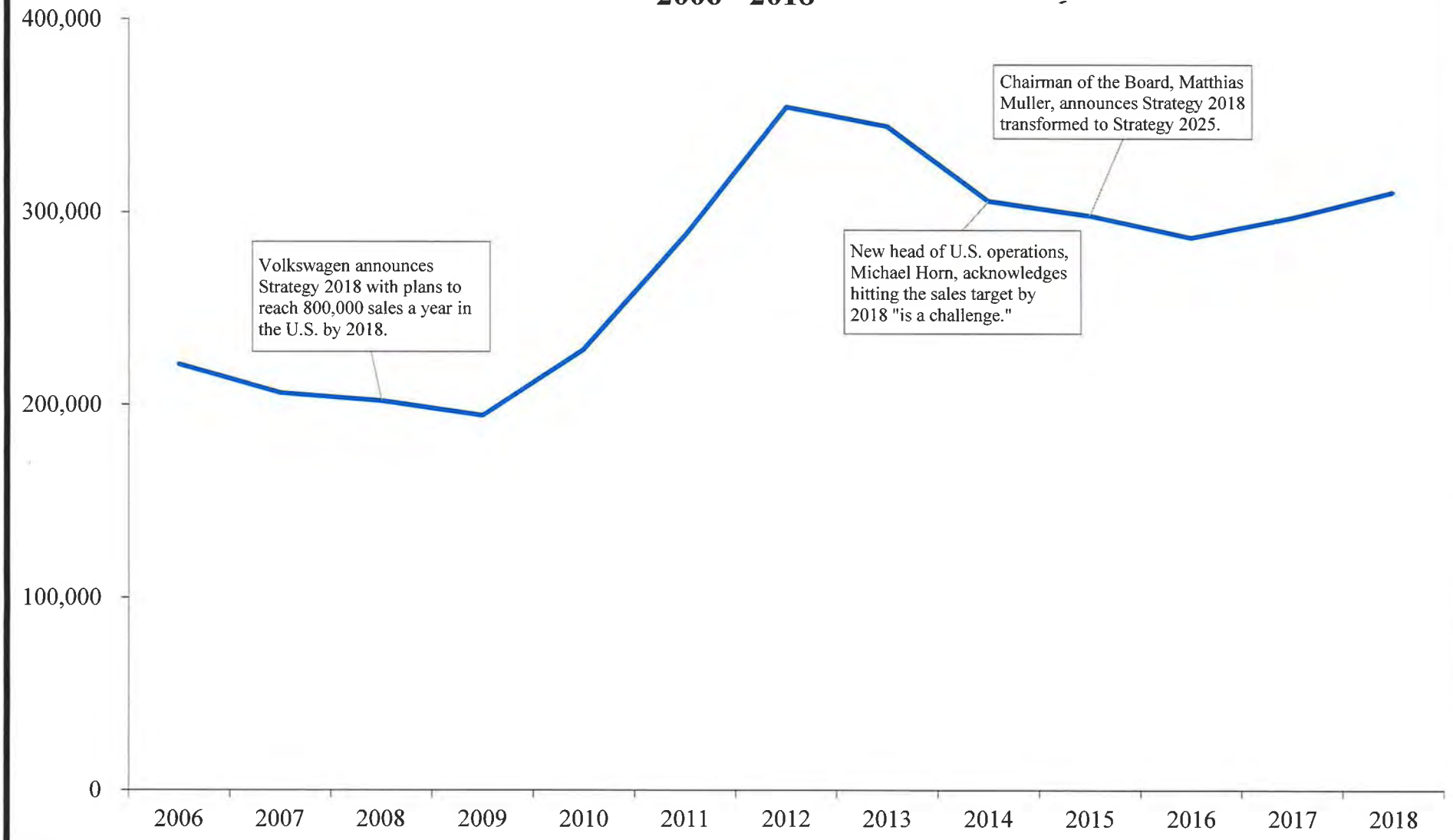
Potential Sources of Mitigating New Sales

1. Accelerated/Unanticipated New Models
2. Accelerated/Unanticipated Redesigned Models
3. Increased Production Capacity?
4. Natural Migration to Non-TDI Models?

Reminder

Potentially mitigating New Sales must be reduced by Goodwill.

New Volkswagen Retail Car + Light Truck Registrations
U.S.
2006 - 2018



SOURCE: The Fontana Group, Inc.
DATA: R.L. Polk & Co., 2006 (11/2011 Update).
R.L. Polk & Co., 2007 - 2010 (11/2012 Update).
IHS Markit, 2011 - 2012 (7/2016 Update).
IHS Markit, 2013 - 2018 (12/2018 Update).
wardsauto.com Article, 1/13/2008.
The Detroit Bureau Article, 5/13/2014.
Volkswagen Newsroom Press Release, 10/28/2015.

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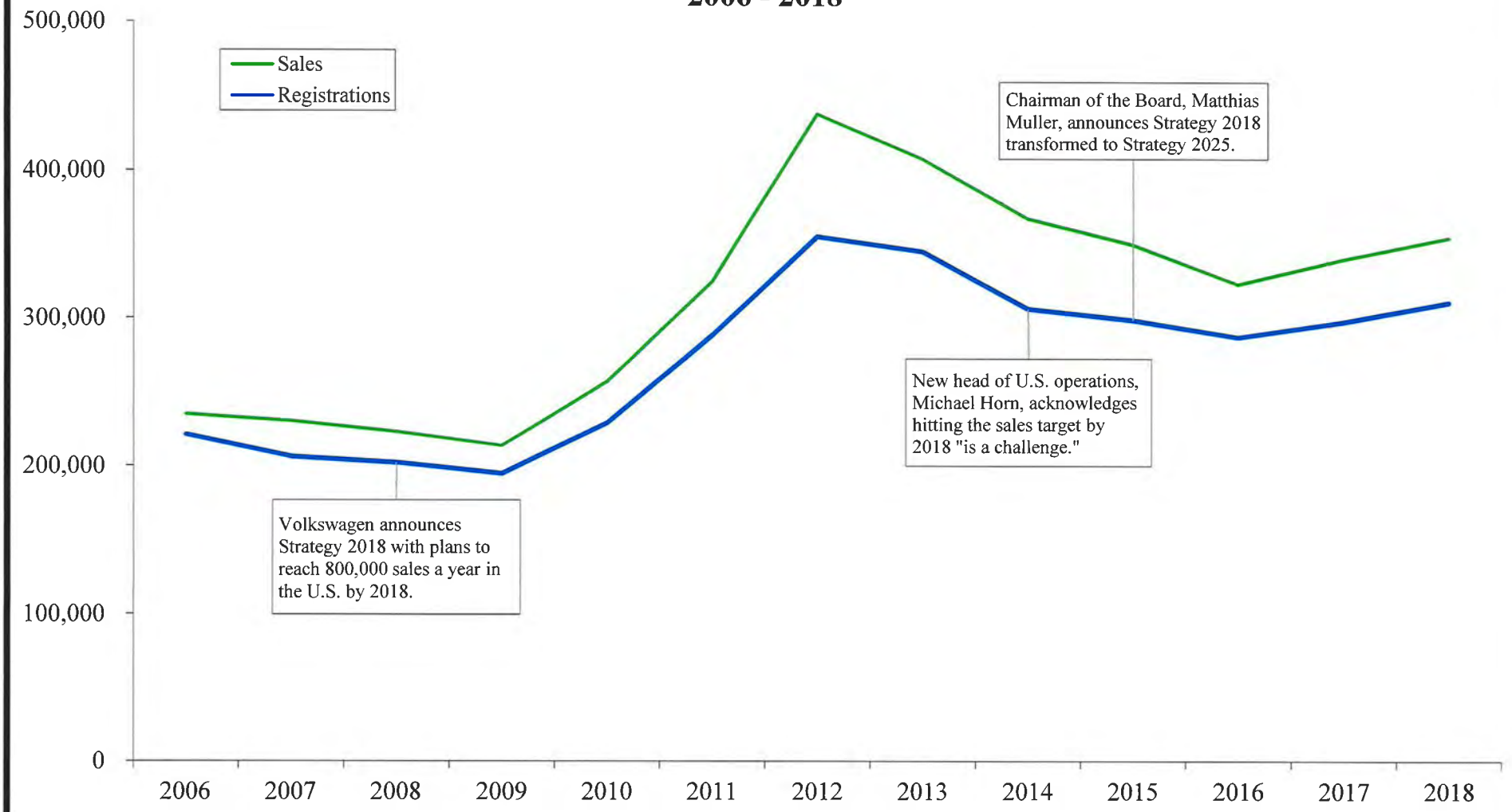
New Volkswagen Car + Truck Sales and New Volkswagen Retail Car + Light Truck Registrations U.S. 2006 - 2018



SOURCE: The Fontana Group, Inc.
DATA: R.L. Polk & Co., 2006 (11/2011 Update).
R.L. Polk & Co., 2007 - 2010 (11/2012 Update).
IHS Markit, 2011 - 2012 (7/2016 Update).
IHS Markit, 2013 - 2018 (12/2018 Update).
wardsauto.com Article, 1/13/2008.
The Detroit Bureau Article, 5/13/2014.
Volkswagen Newsroom Press Release, 10/28/2015.
Automotive News Data Center, 2006 - 2018.

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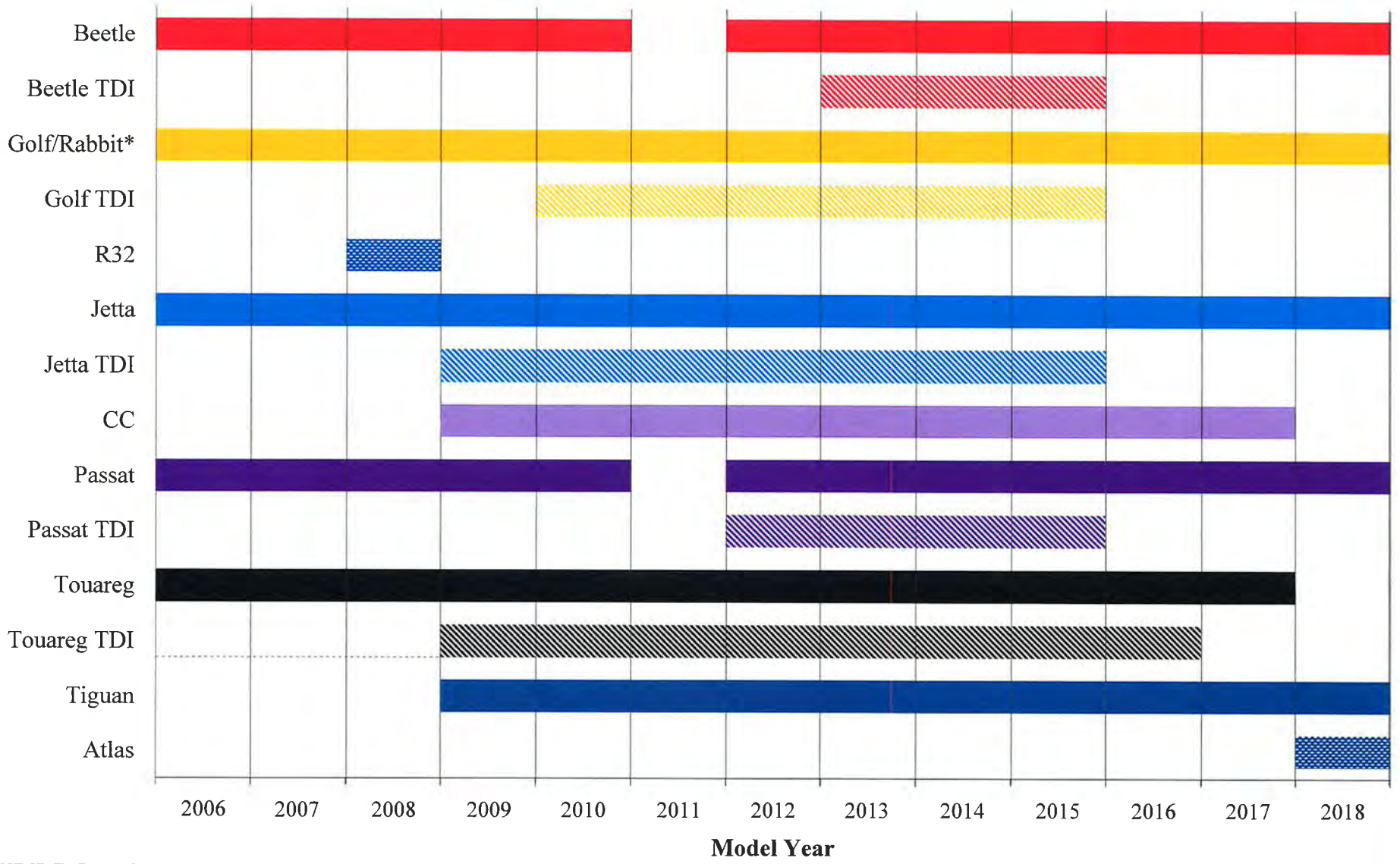
Volkswagen Models Sold within Polk/IHS Segments with Volkswagen TDI Sales
U.S.



SOURCE: The Fontana Group, Inc.
DATA: R.L. Polk & Co., 2006 (11/2011 Update).
R.L. Polk & Co., 2007 - 2010 (11/2012 Update).
IHS Markit, 2011 - 2012 (7/2016 Update).
IHS Markit, 2013 - 2018 (12/2018 Update).
Ward's Automotive Yearbook, 2006 - 2018.

* Golf renamed Rabbit in MY 2006/MY 2007 and changed back to Golf in MY 2010.

F:\VWDB:TIMELINE.XLSX:CMY:13:TKHEHL

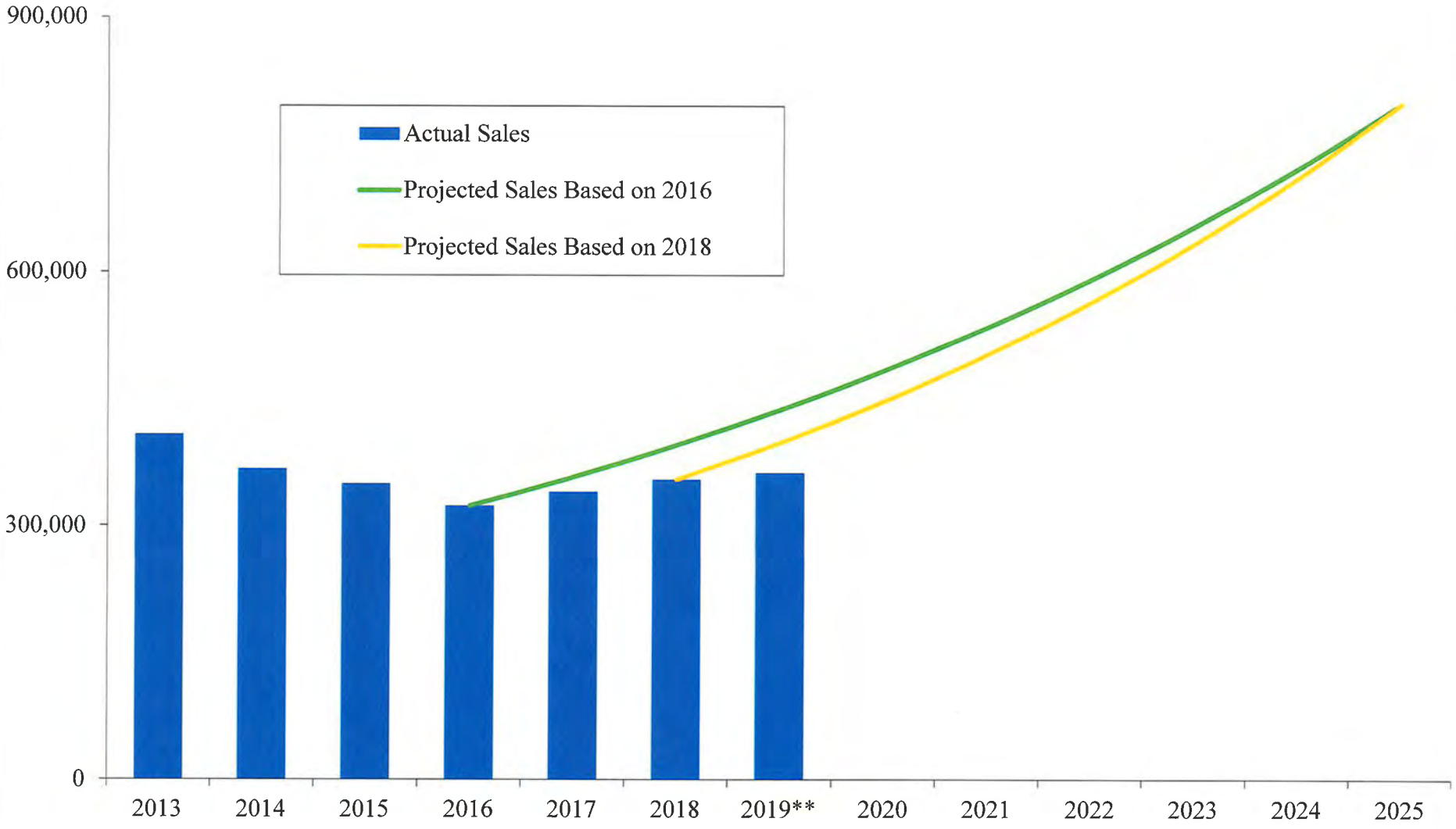
Timeline of Volkswagen Models[(1)] Entering/Exiting the Market and Ward's Schedule of Refreshes/Redesigns[(2)]
U.S.
MY 2006 - MY 2018

	MY 2006	MY 2007	MY 2008	MY 2009	MY 2010	MY 2011	MY 2012	MY 2013	MY 2014	MY 2015	MY 2016	MY 2017	MY 2018
Beetle						See Note (3)	Redesigned	Convertible added					
Beetle TDI								Model Introduced			Discontinued		
Golf/ Rabbit (3)							Golf R (5) added		Golf R not produced	See Note (6)		Alltrack added	e-Golf added
Golf TDI					Model Introduced						Discontinued		
Jetta	See Note (7)		3 model designs added	Wagon added		Sedan Redesigned		Redesigned features; Hybrid added				See Note (7)	
Jetta TDI				Model Introduced		Sedan Redesigned		Redesigned features			Discontinued		
CC				Model Introduced									Discontinued
Passat	New generation					See Note (3)	Redesigned						
Passat TDI							Model Introduced				Discontinued		
Touareg			Redesigned			Redesigned; Hybrid added				Refreshed	Hybrid Discontinued		Discontinued
Touareg TDI				Model Introduced		Redesigned				Refreshed		Discontinued	
Tiguan				Model Introduced			Redesigned					See Note (8)	New generation
Atlas													Model Introduced

(1) Volkswagen Models sold within Polk/IHS Segments with Volkswagen TDI Sales.
(2) Some Updates are Characterized as a Redesign by Ward's, but are more Consistent with Major Refreshes.
(3) Model not produced in MY 2011.
(4) Golf renamed Rabbit in MY 2006/MY 2007 and changed back to Golf in MY 2010.
(5) Golf R succeeded the R32.
(6) Golf R reintroduced; New generation Golf GTI introduced. Golf SportWagen replaces Jetta SportWagen.
(7) Interim '05 GLI variant added to lineup in MY 2006. Hybrid discontinued in MY 2017.
(8) Wolfsburg and Sport models added.
NOTE: R32 only produced in MY 2008 and is not shown.

SOURCE: The Fontana Group, Inc.
DATA: R.L. Polk & Co., 2006 (11/2011 Update)
R.L. Polk & Co., 2007 - 2010 (11/2012 Update).
IHS Markit, 2011 - 2012 (7/2016 Update).
IHS Markit, 2013 - 2018 (12/2018 Update).
Ward's Automotive Yearbook, 2006 - 2018.
Car and Driver Article, 6/1/2005.
F:\VWDB: TIMELINE XLSX:SDAT:13:TKHEHL:RTOTOHL:77

Actual and Projected* New Volkswagen Total Car + Light Truck Sales
U.S.
2013 - 2025



* Projected Sales assume a constant annual rate of growth between base year and 2025 target of 800,000 sales.
** 2019 Actual Sales extrapolated based on March 2019 YTD sales multiplied by the ratio of December 2018 YTD to March 2018 YTD sales (4.217).

SOURCE: The Fontana Group, Inc.
DATA: Auto News, 2013 - 3/2019.

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Actual and Projected* New Volkswagen Total Car + Light Truck Sales
U.S.
2013 - 2025

	Actual Sales	Projected* Sales Based on 2016	Projected* Sales Based on 2018
2013	407,704		
2014	366,970		
2015	349,440		
2016	322,948		
2017	339,676	357,195	
2018	354,064	395,074	
2019	362,162 **	436,970	397,790
2020		483,309	446,917
2021		534,562	502,111
2022		591,250	564,121
2023		653,949	633,789
2024		723,297	712,061
2025		800,000	800,000

* Projected Sales assume a constant annual rate of growth between base year and 2025 target of 800,000 sales.

** 2019 Actual Sales extrapolated based on March 2019 YTD sales multiplied by the ratio of December 2018 YTD to March 2018 YTD sales (4.217).

SOURCE: The Fontana Group, Inc.
DATA: Auto News, 2013 - 3/2019.
F:\VWDB: VWSLS.XLSX:SND:73:TMTHHL

Ford is basically giving up on US car business, and GM is not far behind

Robert Ferris

0:00 / 0:00

So is it really the end of the American car on its home turf?

From the way Detroit's major executives are talking, it would seem so.

Ford said Wednesday it will only offer two new cars in North America over the coming years — its iconic Mustang and the Focus Active, a rugged-looking hatchback that has already debuted in Europe, and somewhat resembles the Subaru Crosstrek or the Buick Regal TourX.

GM is moving along the same lines.

"I think we have been on this path for a number of years," GM CFO Chuck Stevens said on a call with reporters on Thursday, after the largest U.S. automaker released first-quarter earnings.

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Many of Fiat-Chrysler's biggest successes have been SUVs in recent years, evidenced by the growth of its Jeep brand.

"Virtually eliminating Ford's NA car portfolio makes a lot of sense, in our view," said Adam Jonas, an analyst at Morgan Stanley. "No more Fusion. No more Focus. No more Fiesta. No more Taurus."

GM still makes quite a few cars. For now, Chevrolet alone still sells somewhere around 12 car models if you count Corvette, although there have been rumors and news it will cut or end production of at least some of those. Buick has some sedans and a crossover that looks a lot like a wagon, and Cadillac has so many sedans industry observers and dealers say it missed the crossover trend.

And despite the fact that American companies are reshaping their lineups, sedans will still form a substantial portion of the vehicles sold in the U.S. for the foreseeable future.

"Although passenger car segments have declined over the last number of years, they are still very important," GM's Stevens said Thursday. "Small cars are important internationally, and they still make up a chunk of sales in the United States."

But crossover sales were largely what drove GM's earnings beat on Thursday, and the automaker's income was down because it had spent a lot of time retooling its factories — to build more trucks. Buick's best-selling model is the subcompact Encore crossover, and Cadillac's biggest debut this year has been the XT4, a model the company is making to finally catch up with rivals already in the luxury crossover segment.

Throughout the rest of 2018, GM's crossover sales should be strong enough to support margins despite costs from new truck launches, CFRA analyst Efraim Levy said in a note Thursday.

By 2022, almost 73 percent of all consumer vehicle sales in the United States are expected to be utility vehicles of some sort, and about 27 percent will be cars, according to auto industry forecasting firm LMC Automotive.

By that same time, LMC automotive expects 84 percent of GM's U.S. sales volume will be SUVs, crossover and trucks. Ford will be at 90 percent, and Chrysler at 97 percent.

So sedans and other cars are expected to still form more than a quarter of all consumer vehicle sales in the U.S., but the overall trend appears to be that American companies especially are giving up trying to sell cars to Americans.

What will they sell instead?

Detroit is already strong in pickups and large SUVs, such as the Cadillac Escalade and Lincoln Navigator, which is enjoying remarkably brisk sales after its first complete redesign in more than a decade. The Big 3 control almost 85 percent of the domestic pickup market, according to LMC Automotive, despite competitive products from foreign brands such as Toyota and Nissan.

And Ford, for example, will also double down on "authentic off-roaders," Ford President of Global Markets Jim Farley said on a conference call Wednesday, after Ford reported first-quarter earnings. This includes trucks like the Raptor, and the upcoming reintroduced Ford Bronco, and an unnamed SUV. GM and Chrysler are entering this segment, too.

The second-largest U.S. automaker also plans to refresh its current lineup of SUVs and crossovers and create new products that fill "white spaces" in the market, essentially meaning the company will try to combine or tweak various designs or combinations of features to find new segments no other company is targeting yet. This means combining various elements of both cars and SUVs in ways that distinguish Ford's vehicles from what is already out there.

"We will have a very diverse passenger car business," Farley said on the call. "It just won't be traditional silhouetted sedans that tend to be commoditized."

In ditching cars and pursuing this strategy, Ford made a difficult choice, said Kelley Blue Book analyst Rebecca Lindland.

"I think this is one of the challenges that the Big 3 has faced, that they really had a tough time finding their way on the car side," Lindland told CNBC. "They have struggled for too long to be

profitable, to be a full-line manufacturer, and they have made the hard decision to start over. The problem is they are so far behind."

Farley is very smart, Lindland said, and Ford has a catalog of vehicle platforms around the world they can search through to quickly develop some products. But it will be challenging.

"Even though they are starting fresh, they have to accelerate their timeline to get their products as soon as possible," she said. "I am driving a Toyota C-HR right now, which I believe is the kind of car they are thinking about making."

WATCH: A visit to the only Tesla Supercharger station with a lounge

GM will kill off these 6 Chevy, Buick, and Cadillac sedans when it idles select factories in 2019

Benjamin Zhang

- **General Motors announced on Monday that it would idle three assembly plants in North America and cut more than 14,000 jobs in a major strategy shift.**
- **The company indicated it would also shift its resources away from passenger cars and toward crossovers, SUVs, trucks, and electric vehicles.**
- **GM also confirmed that six passenger-car models made at the plants would go out of production.**
- **These models include the Chevrolet Cruze, Impala, and Volt; the Cadillac CT6 and XTS; and the Buick LaCrosse.**

General Motors announced a major shift in its business strategy on Monday that will see the automaker shift its focus toward trucks, SUVs, and electric vehicles.

The announcement also signals a shift away from the traditional sedan, which has been losing sales to crossovers and SUVs for much of the past decade.

As a result, the company said it would "unallocate" production at three assembly plants that build sedans: Oshawa Assembly in Canada, Detroit-Hamtramck Assembly in Michigan, and Lordstown Assembly in Ohio.

To unallocate production simply means GM won't assign any models to be produced at these facilities beyond 2019. According to Matthew DeBord, Business Insider's senior transportation correspondent, GM can't officially close these plants under its current UAW contract, set to be renegotiated in 2019.

GM said it would also idle two factories in Maryland and Michigan that supply transmissions to those three assembly plants.

The company also announced it would reduce its salaried and salaried contract employees by 15%, including a 25% reduction in the number of executives. That equates to more than 14,000 jobs.

GM says the new strategy will save the company $6 billion.

As for the cars made at the soon-to-be-idled plants, GM has confirmed that they too will get the ax.

Based on the numbers, the automaker's move away from sedans makes sense. Through the first three quarters of this year, GM's US sales were down 1.2%, though its sedans performed, on the whole, substantially worse.

For example, US sales of the Lordstown-produced Chevrolet Cruze compact sedan were down 26.5% from the same period last year. The Hamtramck-made Chevrolet Volt range-extended EV saw sales fall by 13.7%, while sales of the full-size Chevy Impala, made at Oshawa and Hamtramck, were down 13.4%.

Hamtramck's Buick LaCrosse and Cadillac CT6 saw sales fall by 14.2% and 10.6%. The only model set to get the ax with positive sales growth is Oshawa's Cadillac XTS, which was up 15.9%.

***Read more**: GM will stop building cars at 3 North American factories and cut its salaried workforce by 15% in 2019 as it shifts to electric and self-driving cars*

While sales have slipped, many of GM's sedans have earned critical acclaim. For example, the current-generation full-size Impala has long been praised for its comfort and refinement and has frequently appeared on Consumer Reports' "Top Picks" list.

"The Impala continues to be a gem among large cars, providing a driving experience that's more akin to a luxury car," the publication said of the Chevy earlier this year.

The Cadillac CT6 represents a high point of American luxury-car making.

"The Cadillac's superb amalgamation of luxury and performance makes the CT6 a true standout in the luxury market," Business Insider said in a 2017 comparison with the Lincoln Continental.

And then there's the Chevrolet Volt. The range-extended EV helped push GM toward the forefront of production electric-propulsion technology when it debuted in 2011. The current-generation Volt debuted in 2016 with expanded capabilities.

Here's a closer look at the six sedans GM is set to discontinue:

1/6

1. Chevrolet Cruze: Production ends March 1. The company sold 109,662 in the US through September.

2/6

3. Chevrolet Volt: Production ends March 1. The company sold 13,243 in the US through September.

3/6

3. Buick LaCrosse: Production ends March 1. The company sold 13,409 through September.

4/6

4. Chevrolet Impala: Production ends June 1. The company sold 43,952 through September.

5/6

5. Cadillac CT6: Production ends June 1. The company sold 7,270 through September.

6/6

6. Cadillac XTS: Production ends Q4 2019. The company sold 12,664 through September.

GM Becomes Latest Car Company to Drop Some Sedans

U.S. automaker to stop making 6 models to focus on SUVs, trucks

By Patrick Olsen
November 26, 2018

Americans have fallen out of love with sedans, so Detroit is dropping them as fast as it can.

General Motors became the third domestic automaker to move away from sedans, saying Monday that it will stop making six models as it bets its future on the more popular pickup trucks and SUVs, as well as electrified and autonomous vehicles.

The cars that are going away include a couple of GM's pioneering models: the Chevrolet Volt, which was the automaker's first plug-in EV hybrid, and the Cadillac CT6, which was the first car to use the Super Cruise

partially automated driving system.

Other models going away include the Cadillac XTS large luxury sedan, the Chevrolet Cruze small car, the Chevrolet Impala large car, and the Buick LaCrosse large luxury sedan.

If you own one of the discontinued models, don't fret. Parts, repair, and service should be easy to get for years to come, a Consumer Reports expert says.

RELATED ROAD TESTS

Buick LaCrosse

Cadillac CT6

Cadillac XTS

Chevrolet Cruze

Chevrolet Impala

GM isn't the only one refocusing its product line. Ford announced earlier this year that it was dropping most of its sedans, except for the iconic Mustang, as it focuses on trucks and SUVs.

Fiat Chrysler Automobiles dropped the Chrysler 200 and Dodge Dart small cars in the summer of 2016, saying it would focus on larger, more profitable vehicles.

Sedan sales are down because consumers enjoy the versatility and seating position they get from riding in SUVs, says Jake Fisher, director of auto testing at Consumer Reports.

"As baby boomers and Generation X drivers get older, they like how easy it is to get into an SUV vs. having the drop down to get into cars," he says.

GM says it will focus on vehicles that will use its "next-generation battery-electric architectures." It says that resources allocated to electric and autonomous vehicle programs will double in the next two years.

What Owners Should Do

You'll still be able to service your car if you own one of these models. GM, like many automakers, shares many parts among its vehicles. In fact, GM shuttered Hummer, Oldsmobile, Pontiac, and Saturn over the last decade, and there are still plenty of parts available for those vehicles.

"Some of the body parts may be affected for short periods of time," says Mel Yu, CR automotive analyst, "but major components are mostly shared with other models and will be continuously produced."

In addition, he says, owners should be able to get their cars repaired at Buick, Cadillac, and Chevrolet dealerships well into the future, even after their car is no longer being produced.

Why Is This Happening Now?

The domestic automakers have a long legacy–and a lot of sales success–with trucks, says Ed Kim, vice president of industry analysis at AutoPacific, and many import brands have lots of sedan history and heritage.

"While sales of stalwarts like Toyota Camry and Corolla are declining, they still represent massive volume," Kim says.

Sales of the Big Three's sedans have taken a proportionally much bigger plunge because they haven't been as popular. Because of that, the Asian brands aren't in a rush to abandon cars.

"They'll just own the sedan space even more than they do now," he says.

Also, Kim notes, it looks like GM is trying to be ready

for any possible downturn in the economy. The automaker went through a painful bankruptcy in 2008 and likely doesn't want to repeat that experience, he says.

"Keep in mind that everything we have seen from GM, post-bankruptcy, has reflected a level of foresight and proactive behavior that is completely unlike the old GM," he says. "The culture is much more forward looking than it has ever been in recent memory."

And all automakers are looking to maximize returns, says Joe Langley, associate director of vehicle forecasting for IHS Markit, an industry analysis firm. Ultimately, he says, "every vehicle has to stand on its own merit. If a vehicle is losing money by just turning on the lights, then it's got to go."

Last, this is one result of the ongoing battle over tariffs, Kim says. The company has said that tariffs on imported steel have cost it $1 billion.

"As GM, like most other automakers, is a truly global operation, the tariff wars are having a detrimental impact on its business," he says. "This is another factor behind GM's changes, and they hurt American jobs in the process."

GM will no longer make these 6 cars

Peter Valdes-Dapena, CNN Business

*Los Angeles (CNN Business)*General Motors will end production of six sedans by the end of 2019.

North American customers want SUVs, crossovers, hatchbacks and trucks. Sedans have fallen out of favor.

As GM (GM) adjusts to changing customer behavior it is also planning ahead for the future. The company announced massive layoffs and is closing five North American facilities as it transitions to self-driving, electric cars of the future.

The soon-to-be closed plants mean GM will no longer make these cars:

Buick LaCrosse

January - September sales: 13,409, down 14.2%

The LaCrosse is a large car built by a brand that was a pioneer in small crossovers. Buick is still shifting heavily toward crossovers: Sales of the Encore and Enclave crossovers are both up this year. But Buick is struggling after turning itself around a few years ago.

Cadillac CT6

January - September sales: 7,270, down 10.6%

The only surprise of the bunch, the CT6 is an unusual choice for GM, because it serves as the tech halo for Cadillac. It's still the only car that has GM's Super Cruise semi-autonomous driving technology. But it's also the least popular Cadillac.

Cadillac XTS

January - September sales: 12,664, up 15.9%

Most XTS cars are sold to limousine and taxi companies. GM recently updated the XTS' design to keep customers happy, helping drive sales higher. It's the only car GM is killing that has performed better in

the first nine months of 2018 than in the first nine months of 2017.

Chevrolet Cruze

January - September sales: 109,662, down 26.5%

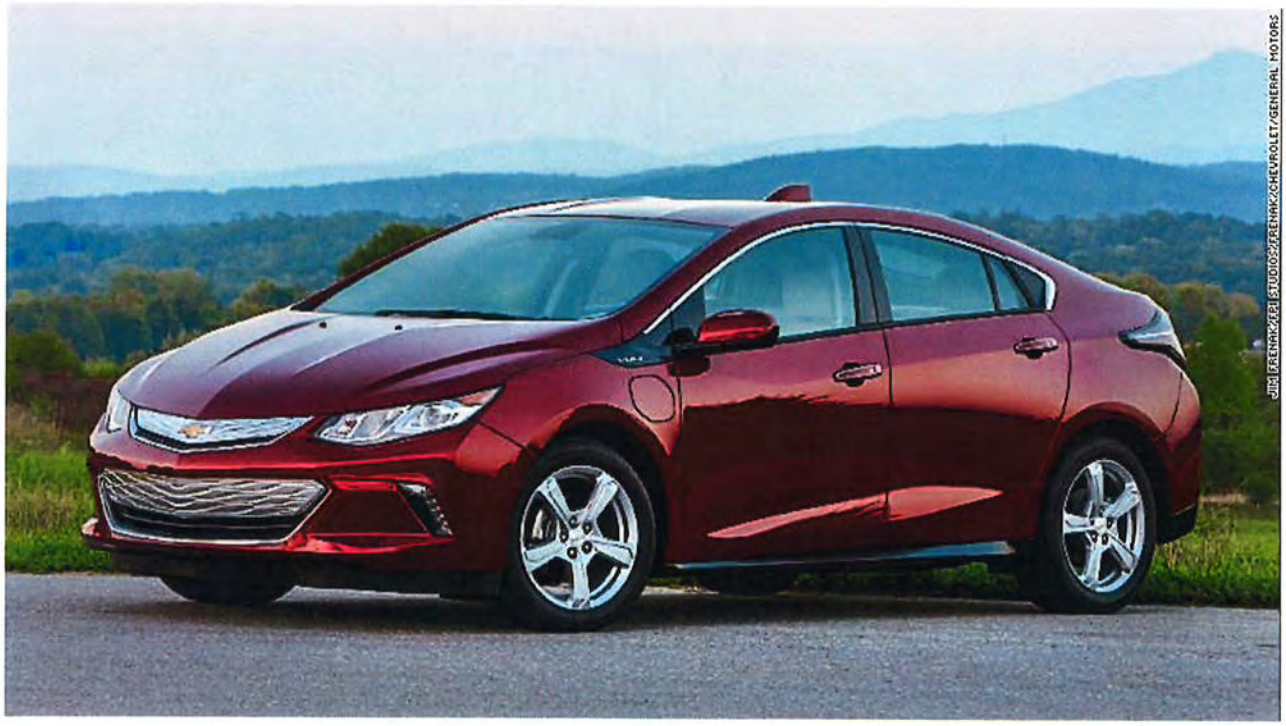
The bestselling Chevy sedan, the Cruze is highly regarded among auto reviewers and enthusiasts. The Cruze was the "Consumer Reports" top pick for compact cars last year. It was beat out by the Toyota Corolla and a handful of other small cars this year, and sales have disappointed.

Chevrolet Impala

January - September sales: 43,952, down 13.4%

The recently redesigned Chevy Impala was the 2018 "Consumer Reports" top pick for large cars. But it's a large car in a market that seems to have forgotten that large cars exist. The Impala is among the worst-selling Chevrolets.

Chevrolet Volt



January - September sales: 13,243, down 13.7%

The Volt is a plug-in electric hybrid sedan lost in the excitement of all-electric cars. Chevy has been promoting the electric Bolt hatchback, though Bolt sales have fallen too.

Ford Is About to Abandon American Sedans

By Keith Naughton

The Model T, the '32 deuce coupe, the Thunderbird, the Mustang: For much of its 115-year history, Ford Motor Co. has been synonymous with cars.

But now Ford, one of the great engines of 20th Century American industry, is about to do the unthinkable: abandon the American car business almost entirely.

Henry Ford and the Model T

Source: Hulton Archive via Getty Images

Just two years from now, a mere 10 percent of the vehicles rolling off Ford assembly lines and into North American showrooms will be sedans and sports cars like the Taurus or Mustang. The rest will be pickups, SUVs and commercial vehicles -- more lucrative models that the company hopes will secure its future as change tears through the global auto industry.

What would Henry Ford think? What might seem like a radical departure for Ford has, in fact, been years in the making. The fuel-price shock that left Detroit on its knees during the Great Recession didn't last, and American consumers have gone right back to buying sport utility vehicles and big trucks like the bread-and-butter F-Series.

Marked for Death: Detroit Ditching Cars to Mint Money Off Trucks

Ford's board ousted its chief executive officer last year and replaced him with Jim Hackett, a cost-cutter who's prepared to make the sort of audacious gambles that Wall Street thinks have been missing.

"The passenger car rationalization plan is just the sort of bold and decisive action we believe investors have been waiting for," Ryan Brinkman, an auto analyst at JPMorgan Chase & Co. wrote in a report Thursday. "It is indicative of a management team for whom there are no sacred cows and which seems increasingly likely to pull other such levers to aggressively improve earnings and

shareholder value."

Ford shares rose as much as 3.8 percent, the biggest intraday gain in six weeks, and were up 3.3 percent to $11.48 as of 3:16 p.m. in New York.

The Marchionne Route

Hackett, 63, is choosing a route similar to the one Fiat Chrysler Automobiles NV used to pass Ford in North American profitability. Sergio Marchionne, CEO of the Italian-American automaker, killed off the Dodge Dart and Chrysler 200 sedans and retooled the factories that had been assembling them. They now build Jeep SUVs and Ram pickups instead. Marchionne aims to surpass General Motors Co.'s margins in North America before his retirement in 2019.

While scrapping several sedans paid off for Fiat Chrysler -- the company almost halved net industrial debt in the first quarter -- the move wasn't devoid of risk and won't be for Ford, either. Both may have to count on fuel staying cheap and supporting demand for Ford Expeditions and Jeep Wrangler SUVs, plus the F-Series and Ram truck lines.

Ford is confident its new lineup will be able withstand rising gasoline prices, Jim Farley, president of global markets, said in an interview.

"We feel comfortable this new lineup will offer customers world-class fuel economy," he said. "In the past, the fuel economy gap -- the penalty people paid for that utility body style -- was pretty high. Now it's very modest."

In the long-term, abandoning car segments may turn out to have been the wrong move if the Trump administration's plans for weaker mileage standards don't last long after his presidency. And Japanese automakers also are likely to welcome less competition for some of their best-sellers, including the Toyota Camry and Honda Civic.

"For Ford, doubling down on trucks and SUVs could be just what the brand needs," Jessica Caldwell, an analyst for Edmunds.com, said in an email. "But this move isn't without risk: Ford is willingly alienating its car owners and conceding market share."

A Shortcut to Better Margins

By not investing in next generations of any car for North America except the Mustang, Ford now anticipates it'll reach an 8 percent profit margin by 2020, two years ahead of schedule. Abstaining from that spending is part of Hackett's plan to cut $25.5 billion in costs by 2022. That figure, announced Wednesday, is almost double what the CEO laid out in October.

"We're going to feed the healthy part of our business and deal decisively with areas that destroy value," Hackett said on an earnings call Wednesday.

While battery-powered vehicles have been money losers thus far, Ford's plans aren't completely inconsistent with the global march toward electrification that's shaking up the auto industry.

Ford will hedge against risk of rising pump prices by spending $11 billion to bring out 40 electrified vehicles by 2022. Among those will be 16 battery-only models, including the Mach 1, a high-performance electric SUV coming in 2020.

The company will expand its offering of crossovers, with vehicles such as the Focus Active coming next year that combine the high-riding attributes of an SUV with lighter-weight car frames to improve fuel economy over traditional big rigs.

Crossovers "are attractive to car owners because they get similar if not better fuel economy as we bring in new technology," Farley said. "They just have different imagery and they give people that utility experience of higher ride height and more interior room."

Ford has not yet determined if its will offer a crossover version of the mid-size Fusion sedan, as it's doing with the Focus compact, Farley said.

All on the Table

The Mustang will be all that's spared from Ford's slashing of its passenger-car lineup in North America. That means the end of the road for slow-sellers such as the Taurus and Fiesta. The automaker conspicuously left Lincoln's Continental and MKZ sedans off its hit list, but since those models share mechanical foundations with Ford siblings, their futures also are in doubt.

"This is going to be disappointing to a lot of people who see the end of an era, but most of those people are over 50," said John Wolkonowicz, an automotive historian and former Ford product planner. "This is about making money. This is what Wall Street demanded."

It's also likely not the end of the dramatic moves coming out of Ford as Hackett seeks to reverse the company's fortunes.

"Everything will be on the table" to fix the automaker, CFO Bob Shanks told reporters Wednesday at the company's headquarters in Dearborn. "We can make different investments, we can partner, we can exit products, markets -- and we will do that."

(Updates with executive's comments starting in the 10th paragraph.)

Automotive News
April 26, 2018 01:00 AM

PRO: Why Ford is killing most of its cars -- and why that's the right move

MICHAEL MARTINEZ
Michael Martinez covers Ford and Tesla for Automotive News.

BLOOMBERG

Any benefits traditional sedans, such as the Fusion, pictured, once held over SUVs have faded considerably. Fuel economy figures are comparable.

Where will new Ford customers turn for an entry-level offering when the automaker's North American dealerships no longer carry a single sedan? We're about to find out.

Last month on the NADA Show floor in Las Vegas, dealers expressed their satisfaction with some of the product decisions CEO Jim

Michael Martinez covers Ford for *Automotive News*.

Hackett was making at Ford.

But, surprisingly, on more than one occasion -- and completely unprompted -- some longtime retailers privately voiced to me their fear that Ford would exit the car business. While sedans haven't been selling well, those dealers said they still filled a crucial role in their showrooms: as inexpensive starter vehicles that helped lure first-time buyers.

And, they were quick to remind me, not everyone wants a beefy pickup or SUV with interior room comparable to a New York studio apartment. Where would new customers turn for an entry-level offering when Ford's North American dealerships no longer carry a single sedan?

We're about to find out.

Ford **announced plans on Wednesday** to ax all of its North American car lineup except for the Mustang and Focus, and that won't be available in its traditional form anymore; the company said it will only offer a Focus Active hatchback that debuts in 2019. The Fiesta, Fusion and Taurus are getting axed, at least in this part of the world.

It's the right business decision. Ford is losing money while tying up precious capacity at plants across North America to build cars that fewer and fewer customers want. Let's be honest, when was the last time you got excited about a Ford car that didn't have an ST or RS badge attached to it?

The sales figures suggest it's been awhile.

Any benefits traditional sedans once held over SUVs have faded considerably. Fuel economy figures are comparable -- the Escape gets

just 1 mpg less than the Fusion, and the Explorer actually has a slightly better EPA rating than the aging Taurus.

In addition, the driving experience of light trucks has become more refined, and customers now place a greater value on space and utility.

"We're not going to invest where it doesn't make sense," CFO Bob Shanks said.

It's all a bit ironic, given that just last decade -- as it was emerging from the Great Recession -- Ford **got $5.9 billion in loans backed by the feds** to help it build high-mileage cars.

But what once worked for Ford -- and the rest of the industry -- no longer makes sense. It's a realization some executives (see: Marchionne, Sergio) have made faster than others, but one that felt inevitable for Ford, especially given Hackett's musings about operational fitness and cost cutting.

As for dealers' concerns about attracting entry-level buyers, it seems Ford will continue to offer plenty of options. By 2020, its small-vehicle lineup will include the Focus Active, a redesigned Escape, the EcoSport and a new small off-road SUV.

So instead of a Fiesta, customers now have an EcoSport. Instead of a Focus sedan, they'll get a Focus wagon. Sure, buyers may pay around 20 percent more, but that price hike is an unavoidable reality no matter what style of vehicle you're in as new technology continues to be added.

And it's unrealistic to think that the company founded on the principle of mobility for the masses would suddenly abandon an important part of its customer base.

"We will have a very diverse passenger car business," Jim Farley, Ford's president of global markets, said Wednesday. "It just won't be traditional silhouetted sedans that tend to be commoditized."

Wall Street generally liked the move, at least on Thursday, as shares rose 2.9 percent to close at $11.43.

The car is dead. Long live the car.

Source URL: *https://www.autonews.com/article/20180426/BLOG06/180429825/pro-why-ford-is-killing-most-of-its-cars-and-why-that-s-the-right-move*

Ford Takes the Exit Ramp from the Car Business

Navigant Research

By Sam Abuelsamid

In many respects, the company that Henry Ford built more than a century ago moved America from the cart to the car (this October will mark the 110th anniversary of the Model T). Today, Ford is undergoing another transformation as the transportation market continues to morph. During its 1Q 2018 financial results, Ford confirmed that its North American vehicle lineup will include only two cars from 2020, the iconic Mustang and the new Focus Active—and even the Focus is morphing into a crossover-style vehicle.

More than 90% of Ford sales in the next decade will be pickup trucks, utilities, and commercial vehicles. Despite the change in the shape of the average Ford vehicle, the company is committed to improving energy efficiency in addition to operational efficiency. In part, that means adding electrified propulsion options to just about every vehicle it builds—from the Mustang to the F-150 and every new SUV.

Until now, Ford has just taken token stabs at the battery EV (BEV) market with vehicles like the defunct Transit Connect Electric and slow-selling Focus Electric. Even its hybrid systems, which are second in sales only behind Toyota, are only available on three nameplates: the soon to be discontinued C-Max and the midsize Fusion and Lincoln MKZ sedans.

Changing with the Times

However, that's all about to change. At the New York International Auto Show in March, Lincoln revealed a concept version of its upcoming Aviator SUV with a plug-in hybrid drivetrain. That vehicle is expected to share its hardware with the next generation of one of Ford's best-selling vehicles, the Explorer. The upcoming Bronco, Escape, and other models will also be available as hybrids.

In addition, Ford is committing to BEVs with a new dedicated platform rather than just conversions like the current Focus. This will enable much improved packaging and performance and a better cost basis. Starting with a performance crossover BEV in 2020 to be built in the Mexican plant that currently builds the Fiesta, Ford plans to launch 15 more BEVs globally in 3 years. While six of the BEVs will be available in North America, many of rest will likely be optimized for the Asian market, where Ford has formed partnerships with Zotye in China and Mahindra Group in India. Some of them may even be cars.

These vehicles will likely represent the bulk of Ford's business for many years to come. But Ford is also working to build its mobility service business into something that is commercially viable and profitable as soon as possible.

Surviving Today's Crises

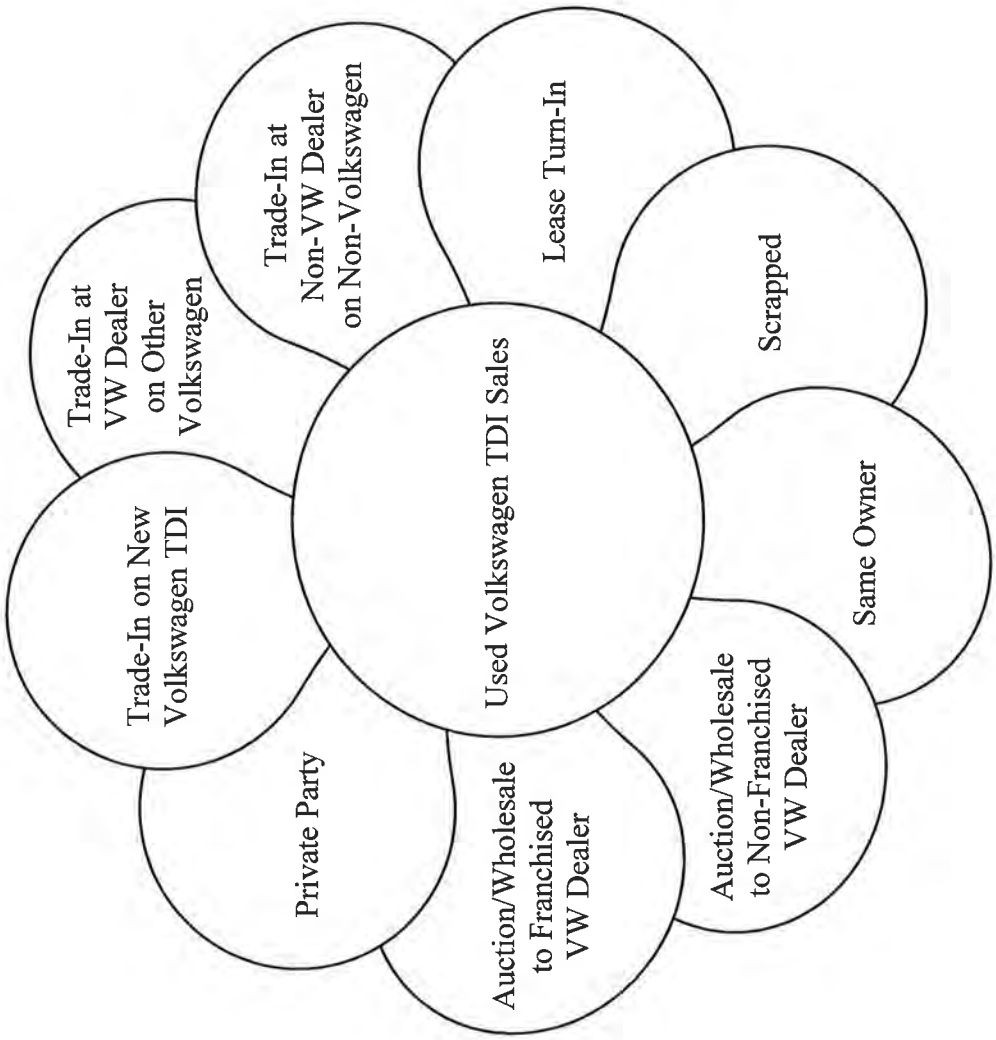
The first three generations of Fords to run their eponymous company, Henry, Edsel, and Henry II, surely wouldn't recognize this new enterprise as the one they built up over more than 7 decades. But during their tenures, Ford also faced several existential

crises and survived—albeit without quite the radical product changes today's business is facing.

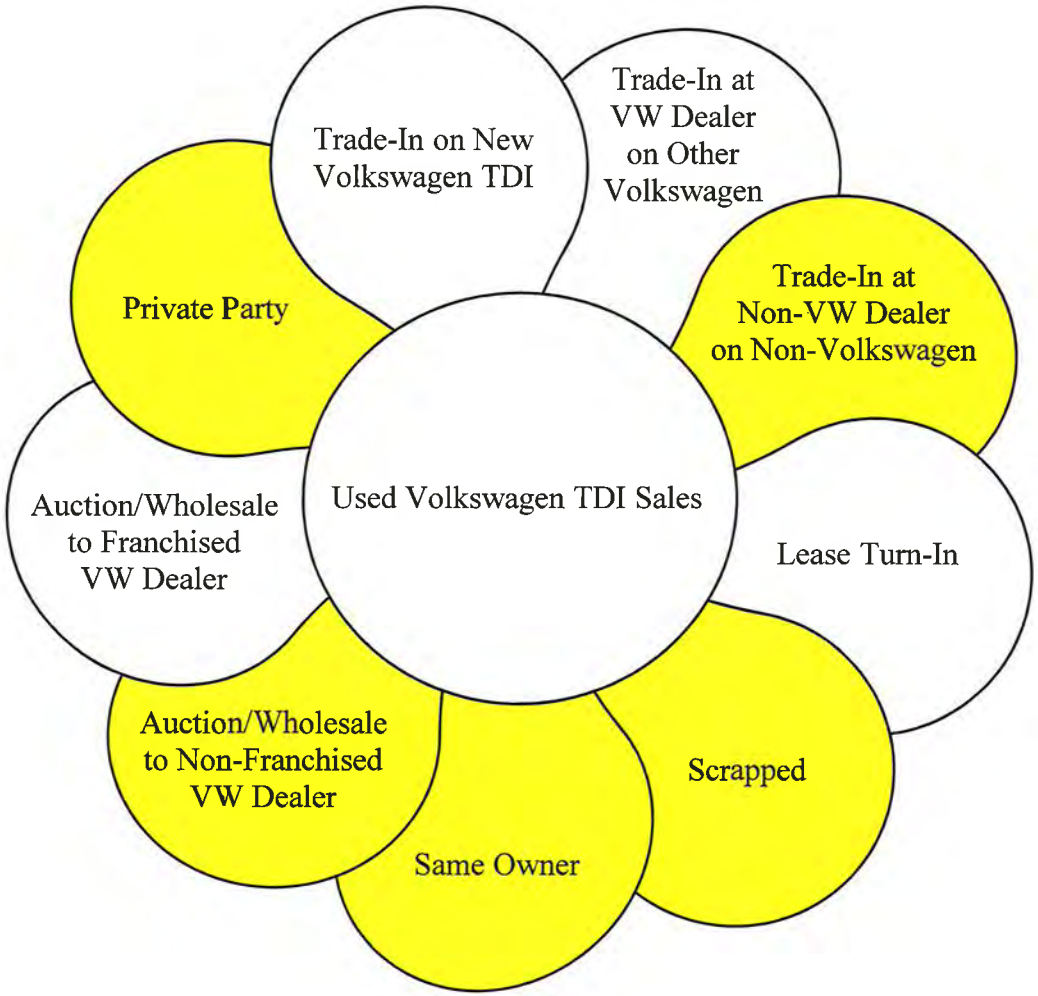
It seems that almost everyone running a car company today is cursed to "live in interesting times." Today's company leaders, including the founder's great grandson Bill Ford and CEO Jim Hackett, will have their work cut out for them to rebuild Ford for a new generation and move travelers from the car to whatever comes next.

However, there is precedent for a company to make similarly shocking moves while transforming into more of a services company. IBM exited the PC business in 2004 that it helped to found to focus on supercomputers, software, and services. And that paid off: within a few years, the company was generating even higher revenue and profits.

Types of Increased Used Volkswagen TDI Sales



Types of Increased Used Volkswagen TDI Sales with Potentially Mitigating Categories Highlighted



Types of Increased Used Volkswagen TDI Sales

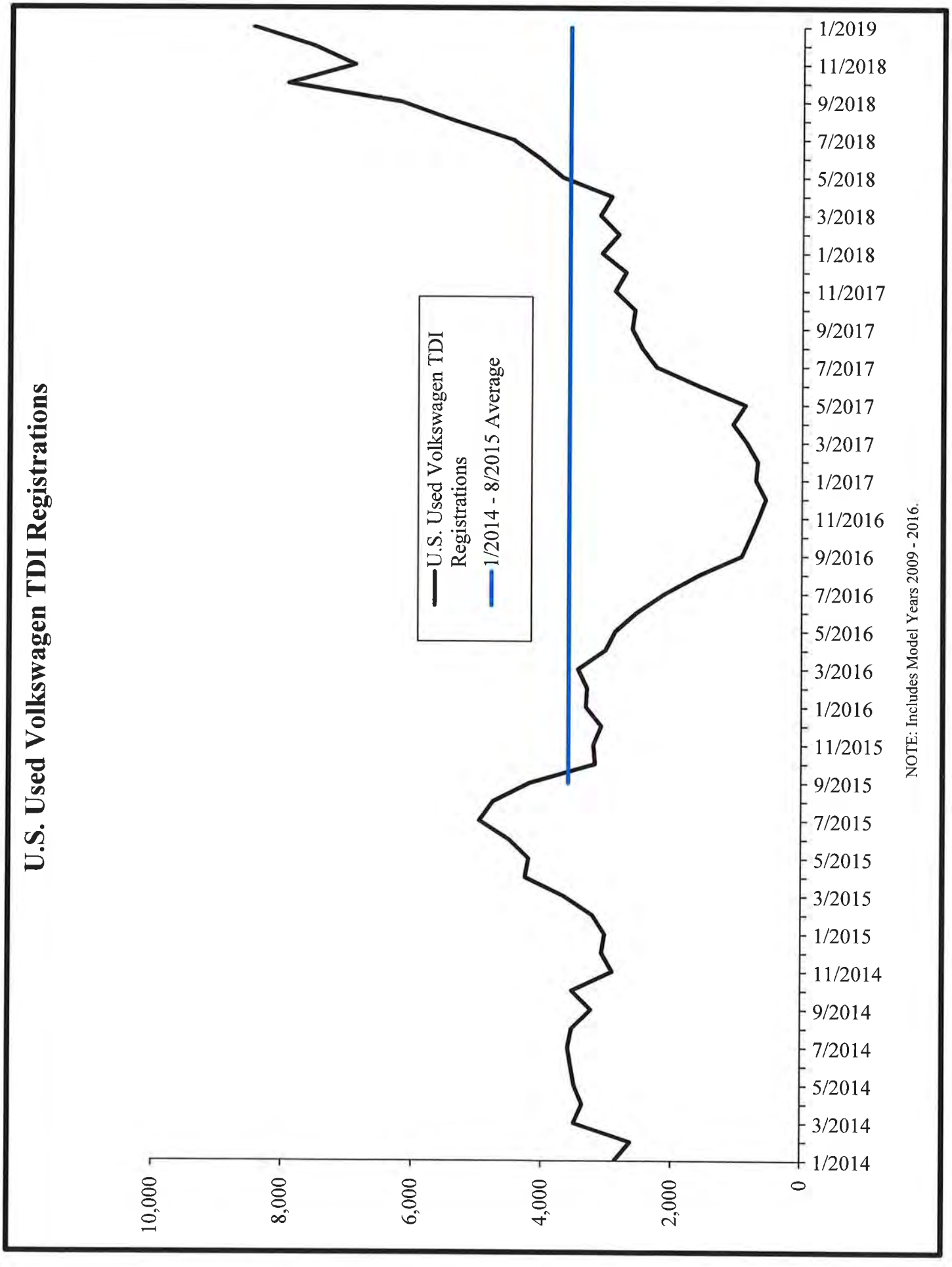
Potentially Mitigating

Category	Comments
Auction/Wholesale to Non-Franchised VW Dealer	Buyback/fixed auction/wholesale sales transferred to franchised VW dealer.
Private Party	Buyback/fixed private party sales transferred to franchised VW dealer.
Same Owner	Buyback/fixed owner-retained vehicles transferred to franchised VW dealer. Potential partial mitigation.
Scrapped	Buyback/fixed scrapped vehicles transferred to franchised VW dealer. Potential partial mitigation.
Trade-In at Non-VW Dealer on Non-Volkswagen	Buyback/fixed trade-in vehicles to non-VW dealers and transferred to franchised VW dealer.

Non-Mitigating

Category	Comments
Auction/Wholesale to Franchised VW Dealer	Would have otherwise occurred.
Lease Turn-In	Would have otherwise occurred.
Trade-In at VW Dealer on Other Volkswagen	Would have otherwise occurred.
Trade-in on New Volkswagen TDI	Already included in goodwill reduction.

Potential Mitigation of Lost Used TDI Sales


U.S. Used Volkswagen TDI Registrations
U.S. Used Volkswagen TDI Registrations
1/2014 - 8/2015 Average
1/2019
11/2018
9/2018
7/2018
5/2018
3/2018
1/2018
11/2017
9/2017
7/2017
5/2017
3/2017
1/2017
11/2016
9/2016
7/2016
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11/2015
9/2015
7/2015
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3/2015
1/2015
11/2014
9/2014
7/2014
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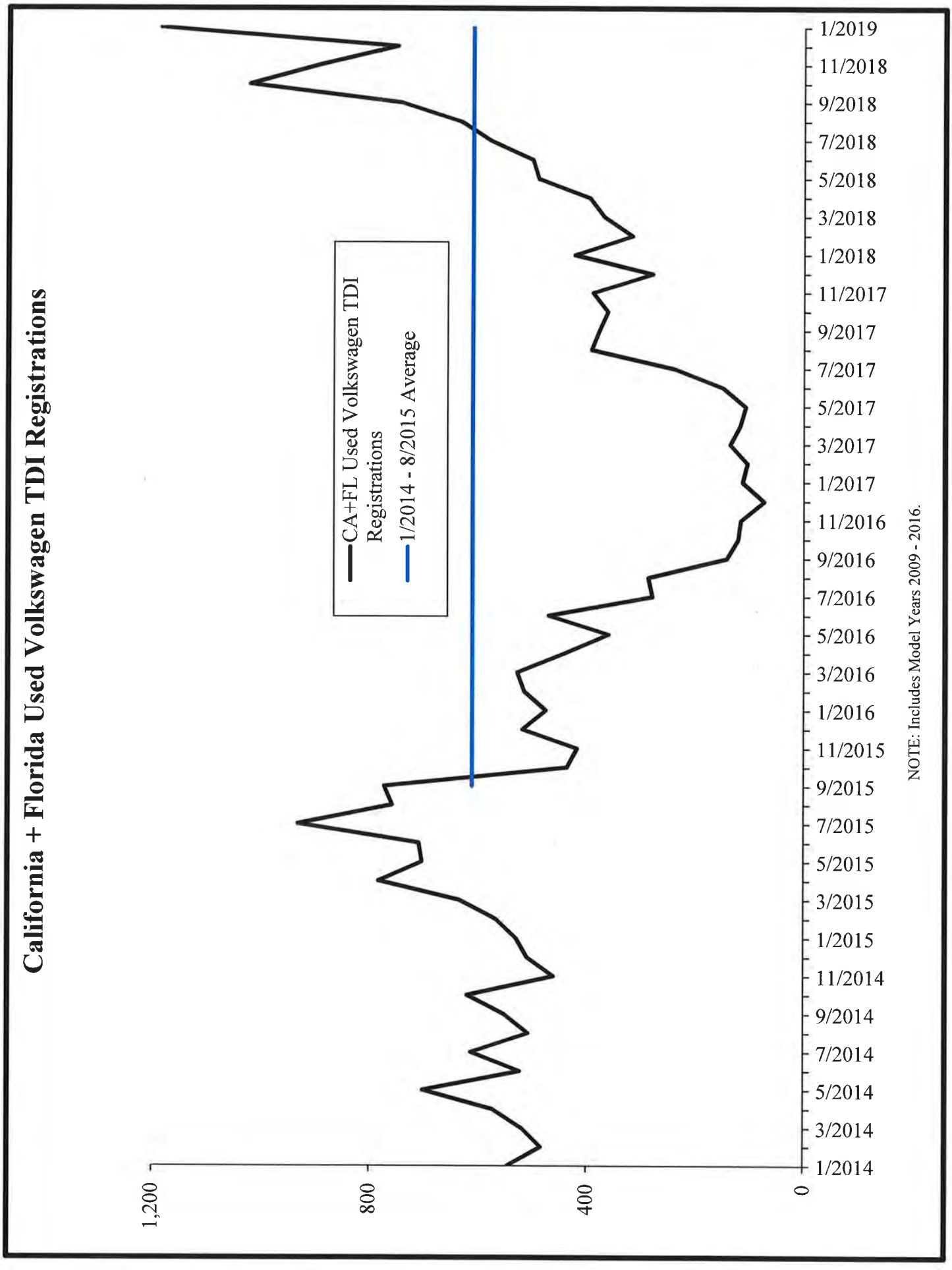
1/2014
10,000
8,000
6,000
4,000
2,000
0
NOTE: Includes Model Years 2009 - 2016.


California + Florida Used Volkswagen TDI Registrations
CA+FL Used Volkswagen TDI Registrations
1/2014 - 8/2015 Average
1,200
800
400
0
1/2019
11/2018
9/2018
7/2018
5/2018
3/2018
1/2018
11/2017
9/2017
7/2017
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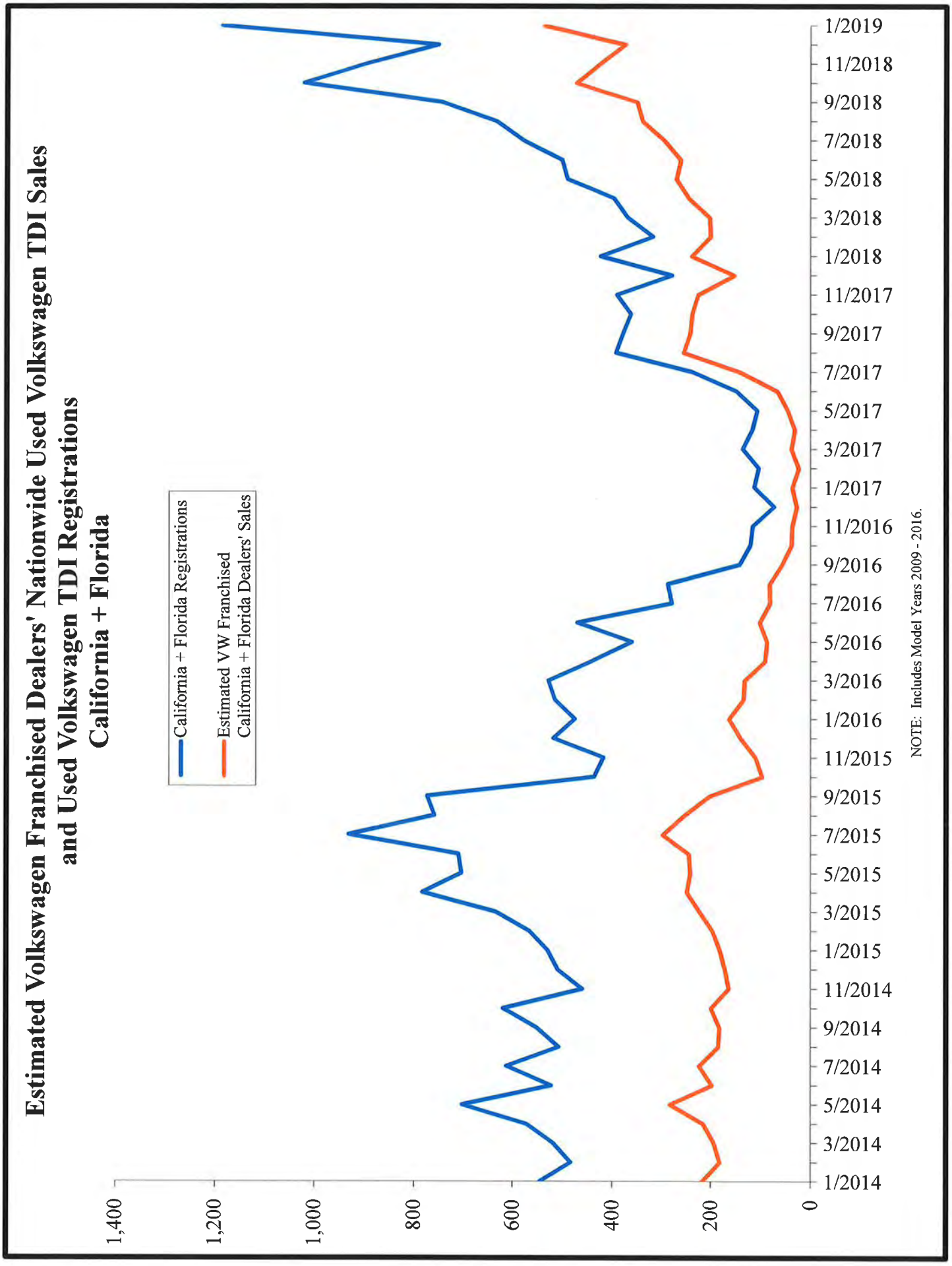
NOTE: Includes Model Years 2009 - 2016.


Estimated Volkswagen Franchised Dealers' Nationwide Used Volkswagen TDI Sales
and Used Volkswagen TDI Registrations
California + Florida
California + Florida Registrations
Estimated VW Franchised
California + Florida Dealers' Sales
1,400
1,200
1,000
800
600
400
200
0
1/2019
11/2018
9/2018
7/2018
5/2018
3/2018
1/2018
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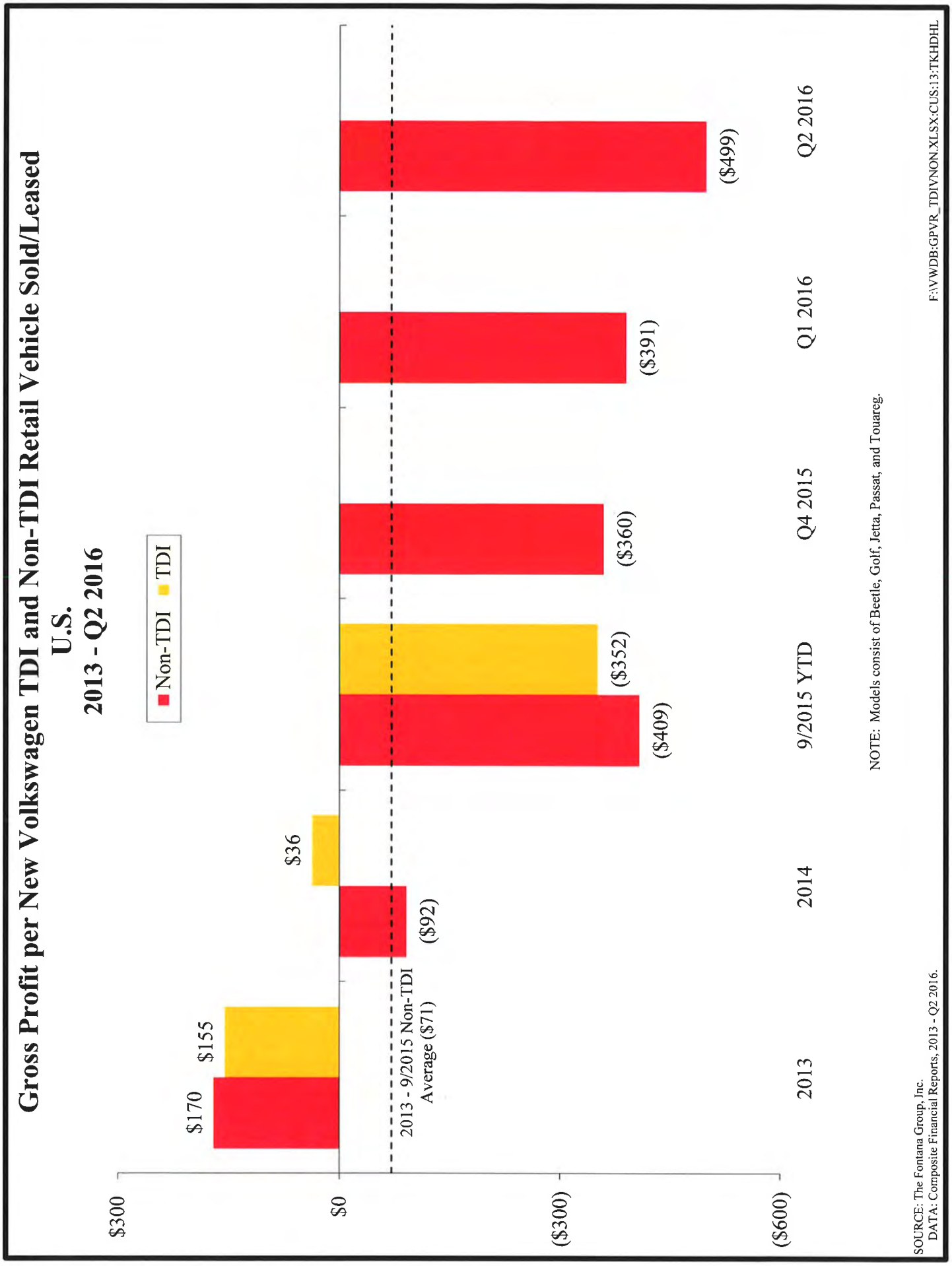
1/2014
NOTE: Includes Model Years 2009 - 2016.

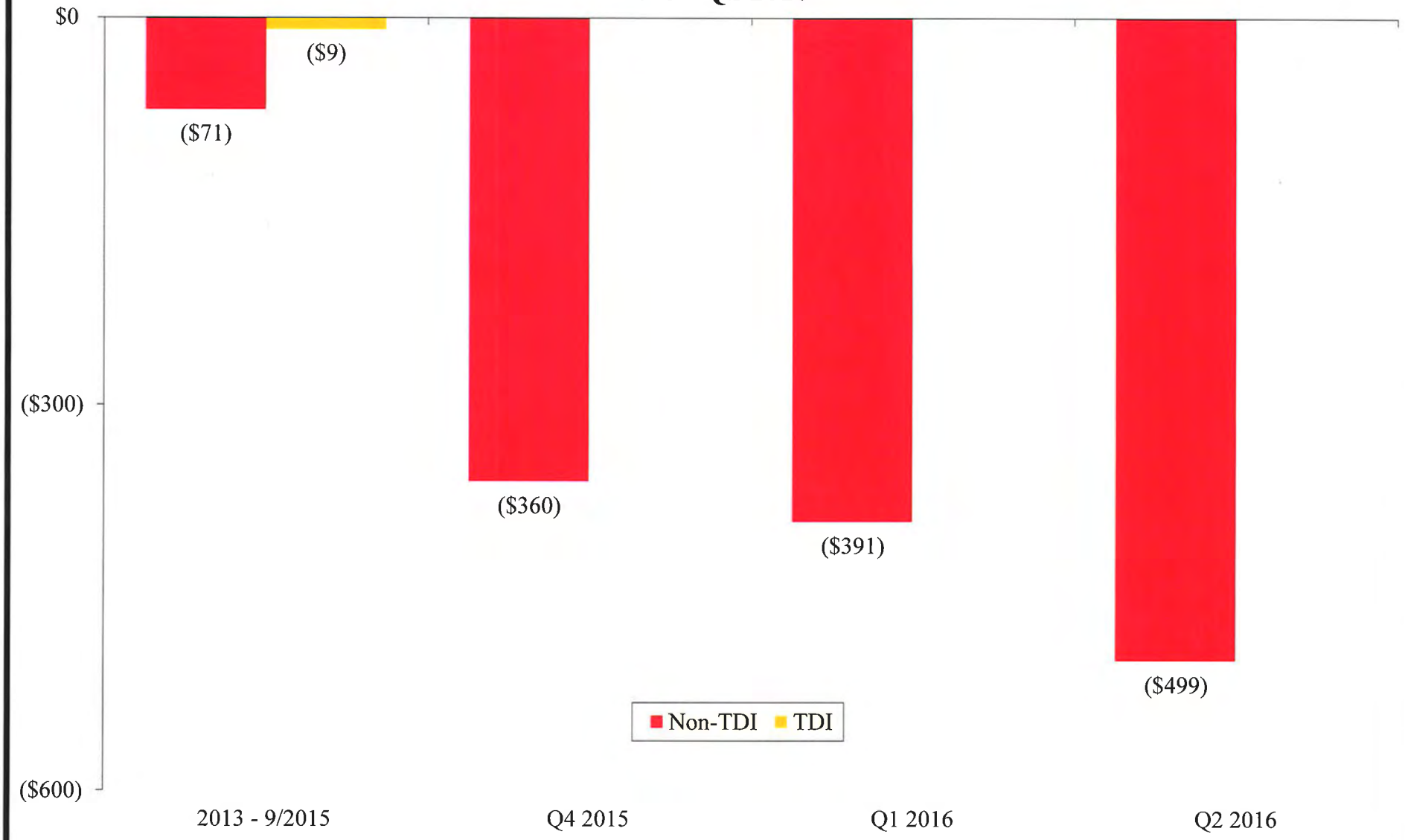
UIO Life Remaining for Volkswagen TDI Buyback Vehicles Reentering the Market on 1/1/2019

Model Year	Vehicle Age as of 3/31/2017*	UIO Life Remaining: 1/1/2019	1/1/2020	1/1/2021	1/1/2022	1/1/2023
2009	8	0	0	0	0	0
2010	7	0	0	0	0	0
2011	6	0.25	0	0	0	0
2012	5	1.25	0.25	0	0	0
2013	4	2.25	1.25	0.25	0	0
2014	3	3.25	2.25	1.25	0.25	0
2015	2	4.25	3.25	2.25	1.25	0.25

Note: Vehicles are assumed to have a 6-year UIO life. Vehicle age reflects an average purchase date of March 31 of the model year of the vehicle.
* Average Buyback Date for TDI vehicles is assumed to be 3/31/2017.


Gross Profit per New Volkswagen TDI and Non-TDI Retail Vehicle Sold/Leased
U.S.
2013 - Q2 2016
Non-TDI
TDI
$300
$0
($300)
($600)
$170
$155
$36
($92)
($409)
($352)
($360)
($391)
($499)
2013 - 9/2015 Non-TDI Average ($71)
2013
2014
9/2015 YTD
Q4 2015
Q1 2016
Q2 2016
NOTE: Models consist of Beetle, Golf, Jetta, Passat, and Touareg.
SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - Q2 2016.
F:\VWDB:GPVR_TDIVNON.XLSX:CUS:13:TKHDHL

Gross Profit per New Volkswagen TDI and Non-TDI Retail Vehicle Sold/Leased
U.S.
2013 - Q2 2016



NOTE: Models consist of Beetle, Golf, Jetta, Passat, and Touareg.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - Q2 2016.

F:\VWDB:GPVR_TDIVNON.XLSX:CUSX:13:TKHDHL

New Volkswagen TDI Gross Profit per Retail Vehicle Sold/Leased
U.S.
2013 - 9/2015

TDI Retail Vehicle Gross Profit

Region	2013	2014	9/2015 YTD	2013 - 9/2015
Midwest	$6,457,416	$3,691,602	($1,077,960)	$9,071,058
Northeast	$1,749,952	$113,778	($1,312,500)	$551,230
Pacific	$3,137,989	$1,473,840	($2,244,528)	$2,367,301
South Central	$229,620	$611,900	($2,374,600)	($1,533,080)
Southeast	($1,517,125)	($3,867,658)	($6,537,948)	($11,922,731)
Sum	**$10,057,852**	**$2,023,462**	**($13,547,536)**	**($1,466,222)**

TDI Retail Vehicles Sold/Leased

Region	2013	2014	9/2015 YTD	2013 - 9/2015
Midwest	10,507	8,357	5,980	24,844
Northeast	11,544	9,261	5,460	26,265
Pacific	18,297	15,840	11,466	45,603
South Central	10,750	10,400	7,100	28,250
Southeast	13,625	12,192	8,515	34,332
Sum	**64,723**	**56,050**	**38,521**	**159,294**

TDI Gross Profit per Retail Vehicle Sold/Leased

Region	2013	2014	9/2015 YTD	2013 - 9/2015
Midwest	$615	$442	($180)	$365
Northeast	$152	$12	($240)	$21
Pacific	$172	$93	($196)	$52
South Central	$21	$59	($334)	($54)
Southeast	($111)	($317)	($768)	($347)
U.S.	**$155**	**$36**	**($352)**	**($9)**

NOTE: Models consist of Beetle, Golf, Jetta, Passat, and Touareg

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015
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New Volkswagen TDI Retail Vehicles Sold Gross Profit
U.S.
2013 - 9/2015

	Average Dealer TDI Retail Vehicle Gross Profit		
Region	**2013**	**2014***	**9/2015 YTD****
Midwest	$48,552	$26,946	($8,292)
Northeast	$11,824	$774	($9,375)
Pacific	$29,327	$12,282	($19,184)
South Central	$2,670	$6,119	($23,746)
Southeast	($12,137)	($30,454)	($49,908)

	Dealer Count		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	133	137	130
Northeast	148	147	140
Pacific	107	120	117
South Central	86	100	100
Southeast	125	127	131

	TDI Retail Vehicle Gross Profit		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	$6,457,416	$3,691,602	($1,077,960)
Northeast	$1,749,952	$113,778	($1,312,500)
Pacific	$3,137,989	$1,473,840	($2,244,528)
South Central	$229,620	$611,900	($2,374,600)
Southeast	($1,517,125)	($3,867,658)	($6,537,948)
U.S.	**$10,057,852**	**$2,023,462**	**($13,547,536)**

* Midwest, Pacific, South Central, and Southeast figures are calculated from 9/2014 YTD Plus Q4 2014.
** Pacific figure is calculated from 2015 Less Q4 2015.
NOTE: Models consist of Beetle, Golf, Jetta, Passat, and Touareg.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015.
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New Volkswagen TDI Retail Vehicles Sold/Leased
U.S.
2013 - 9/2015

	Average Dealer TDI Retail Vehicles Sold/Leased		
Region	**2013**	**2014***	**9/2015 YTD**
Midwest	79	61	46
Northeast	78	63	39
Pacific	171	132	98
South Central	125	104	71
Southeast	109	96	65

	Dealer Count		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	133	137	130
Northeast	148	147	140
Pacific	107	120	117
South Central	86	100	100
Southeast	125	127	131

	TDI Retail Vehicles Sold/Leased		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	10,507	8,357	5,980
Northeast	11,544	9,261	5,460
Pacific	18,297	15,840	11,466
South Central	10,750	10,400	7,100
Southeast	13,625	12,192	8,515
U.S.	**64,723**	**56,050**	**38,521**

* Midwest, Pacific, South Central, and Southeast figures are calculated from 9/2014 YTD Plus Q4 2014.
** Pacific figure is calculated from 2015 Less Q4 2015.
NOTE: Models consist of Beetle, Golf, Jetta, Passat, and Touareg.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015.
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New Volkswagen Non-TDI Car + Light Truck
Gross Profit per Retail Vehicle Sold/Leased
U.S.
2013 - 9/2015

	Non-TDI Retail Vehicle Gross Profit			
Region	**2013**	**2014**	**9/2015 YTD**	**2013 - 9/2015**
Midwest	$19,246,031	$12,143,406	($1,645,280)	$29,744,157
Northeast	$7,121,612	$1,217,601	($5,202,400)	$3,136,813
Pacific	$6,744,531	($6,678,360)	($13,483,548)	($13,417,377)
South Central	$4,494,790	($3,725,500)	($11,267,100)	($10,497,810)
Southeast	($2,081,750)	($20,234,402)	($24,365,738)	($46,681,890)
Sum	**$35,525,214**	**($17,277,255)**	**($55,964,066)**	**($37,716,107)**

	Non-TDI Retail Vehicles Sold/Leased			
Region	**2013**	**2014**	**9/2015 YTD**	**2013 - 9/2015**
Midwest	33,516	27,948	19,370	80,834
Northeast	49,728	43,218	29,400	122,346
Pacific	44,191	41,160	32,409	117,760
South Central	31,820	30,700	23,000	85,520
Southeast	49,375	44,450	32,619	126,444
Sum	**208,630**	**187,476**	**136,798**	**532,904**

	Non-TDI Gross Profit per Retail Vehicle Sold/Leased			
Region	**2013**	**2014**	**9/2015 YTD**	**2013 - 9/2015**
Midwest	$574	$435	($85)	$368
Northeast	$143	$28	($177)	$26
Pacific	$153	($162)	($416)	($114)
South Central	$141	($121)	($490)	($123)
Southeast	($42)	($455)	($747)	($369)
U.S.	**$170**	**($92)**	**($409)**	**($71)**

NOTE: Models consist of Beetle, Golf, Jetta, Passat, and Touareg.

SOURCE: The Fontana Group, Inc
DATA: Composite Financial Reports, 2013 - 2015
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New Volkswagen Non-TDI Retail Vehicles Sold/Leased
U.S.
2013 - 9/2015

	Average Dealer Non-TDI Retail Vehicle Gross Profit		
Region	**2013**	**2014***	**9/2015 YTD****
Midwest	$144,707	$88,638	($12,656)
Northeast	$48,119	$8,283	($37,160)
Pacific	$63,033	($55,653)	($115,244)
South Central	$52,265	($37,255)	($112,671)
Southeast	($16,654)	($159,326)	($185,998)

	Dealer Count		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	133	137	130
Northeast	148	147	140
Pacific	107	120	117
South Central	86	100	100
Southeast	125	127	131

	Non-TDI Retail Vehicle Gross Profit		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	$19,246,031	$12,143,406	($1,645,280)
Northeast	$7,121,612	$1,217,601	($5,202,400)
Pacific	$6,744,531	($6,678,360)	($13,483,548)
South Central	$4,494,790	($3,725,500)	($11,267,100)
Southeast	($2,081,750)	($20,234,402)	($24,365,738)
U.S.	**$35,525,214**	**($17,277,255)**	**($55,964,066)**

* Midwest, Pacific, South Central, and Southeast figures are calculated from 9/2014 YTD Plus Q4 2014.
** Pacific figure is calculated from 2015 Less Q4 2015.
NOTE: Models consist of Beetle, Golf, Jetta, Passat, and Touareg.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015.
F:\VWDB: GPVR_TDIVNON.XLSX:SNG5:13:TKHDHL

New Volkswagen Non-TDI Retail Vehicles Sold/Leased
U.S.
2013 - 9/2015

	Average Dealer Non-TDI Retail Vehicles Sold/Leased		
Region	**2013**	**2014***	**9/2015 YTD****
Midwest	252	204	149
Northeast	336	294	210
Pacific	413	343	277
South Central	370	307	230
Southeast	395	350	249

	Dealer Count		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	133	137	130
Northeast	148	147	140
Pacific	107	120	117
South Central	86	100	100
Southeast	125	127	131

	Non-TDI Retail Vehicles Sold/Leased		
Region	**2013**	**2014**	**9/2015 YTD**
Midwest	33,516	27,948	19,370
Northeast	49,728	43,218	29,400
Pacific	44,191	41,160	32,409
South Central	31,820	30,700	23,000
Southeast	49,375	44,450	32,619
U.S.	**208,630**	**187,476**	**136,798**

* Midwest, Pacific, South Central, and Southeast figures are calculated from 9/2014 YTD Plus Q4 2014.
** Pacific figure is calculated from 2015 Less Q4 2015.
NOTE: Models consist of Beetle, Golf, Jetta, Passat, and Touareg.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, 2013 - 2015.
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New Volkswagen Non-TDI Gross Profit per Retail Vehicle Sold/Leased
U.S.
Q4 2015 - Q2 2016

	Non-TDI Retail Vehicle Gross Profit		
Region	**Q4 2015**	**Q1 2016**	**Q2 2016**
Midwest	($670,179)	($1,102,418)	($2,239,188)
Northeast	($1,042,422)	($821,088)	($1,798,654)
Pacific	($5,715,040)	($4,200,940)	($6,291,524)
South Central	($1,353,750)	($3,386,600)	($4,264,612)
Southeast	($8,097,846)	($7,704,424)	($10,946,628)
Sum	**($16,879,237)**	**($17,215,470)**	**($25,540,606)**

	Non-TDI Retail Vehicles Sold/Leased		
Region	**Q4 2015**	**Q1 2016**	**Q2 2016**
Midwest	6,604	5,896	7,038
Northeast	9,514	9,216	10,725
Pacific	12,650	11,136	11,682
South Central	6,555	6,900	8,755
Southeast	11,610	10,906	12,936
Sum	**46,933**	**44,054**	**51,136**

	Non-TDI Gross Profit per Retail Vehicle Sold/Leased		
Region	**Q4 2015**	**Q1 2016**	**Q2 2016**
Midwest	($101)	($187)	($318)
Northeast	($110)	($89)	($168)
Pacific	($452)	($377)	($539)
South Central	($207)	($491)	($487)
Southeast	($697)	($706)	($846)
U.S.	**($360)**	**($391)**	**($499)**

NOTE: Models consist of Beetle, Golf, Jetta, Passat, and Touareg.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, Q4 2015 - Q2 2016
F:\VWDB: GPVR_TDIVNON.XLSX:SN$6:13:TKHDHL

New Volkswagen Non-TDI Retail Vehicles Sold/Leased
U.S.
Q4 2015 - Q2 2016

	Average Dealer Non-TDI Retail Vehicle Gross Profit		
Region	**Q4 2015**	**Q1 2016**	**Q2 2016**
Midwest	($5,277)	($8,227)	($16,226)
Northeast	($7,341)	($5,702)	($12,578)
Pacific	($49,696)	($36,215)	($53,318)
South Central	($14,250)	($33,866)	($41,404)
Southeast	($62,774)	($57,928)	($82,929)

	Dealer Count		
Region	**Q4 2015**	**Q1 2016**	**Q2 2016**
Midwest	127	134	138
Northeast	142	144	143
Pacific	115	116	118
South Central	95	100	103
Southeast	129	133	132

	Non-TDI Retail Vehicle Gross Profit		
Region	**Q4 2015**	**Q1 2016**	**Q2 2016**
Midwest	($670,179)	($1,102,418)	($2,239,188)
Northeast	($1,042,422)	($821,088)	($1,798,654)
Pacific	($5,715,040)	($4,200,940)	($6,291,524)
South Central	($1,353,750)	($3,386,600)	($4,264,612)
Southeast	($8,097,846)	($7,704,424)	($10,946,628)
U.S.	**($16,879,237)**	**($17,215,470)**	**($25,540,606)**

NOTE: Models consist of Beetle, Golf, Jetta, Passat, and Touareg.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, Q4 2015 - Q2 2016.
F:\VWDB: GPVR_TDIVNON.XLSX:SNG6:13:TKHDHL

New Volkswagen Non-TDI Retail Vehicles Sold/Leased
U.S.
Q4 2015 - Q2 2016

	Average Dealer Non-TDI Retail Vehicles Sold/Leased		
Region	**Q4 2015**	**Q1 2016**	**Q2 2016**
Midwest	52	44	51
Northeast	67	64	75
Pacific	110	96	99
South Central	69	69	85
Southeast	90	82	98

	Dealer Count		
Region	**Q4 2015**	**Q1 2016**	**Q2 2016**
Midwest	127	134	138
Northeast	142	144	143
Pacific	115	116	118
South Central	95	100	103
Southeast	129	133	132

	Non-TDI Retail Vehicles Sold/Leased		
Region	**Q4 2015**	**Q1 2016**	**Q2 2016**
Midwest	6,604	5,896	7,038
Northeast	9,514	9,216	10,725
Pacific	12,650	11,136	11,682
South Central	6,555	6,900	8,755
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U.S.	**46,933**	**44,054**	**51,136**

NOTE: Models consist of Beetle, Golf, Jetta, Passat, and Touareg.

SOURCE: The Fontana Group, Inc.
DATA: Composite Financial Reports, Q4 2015 - Q2 2016.
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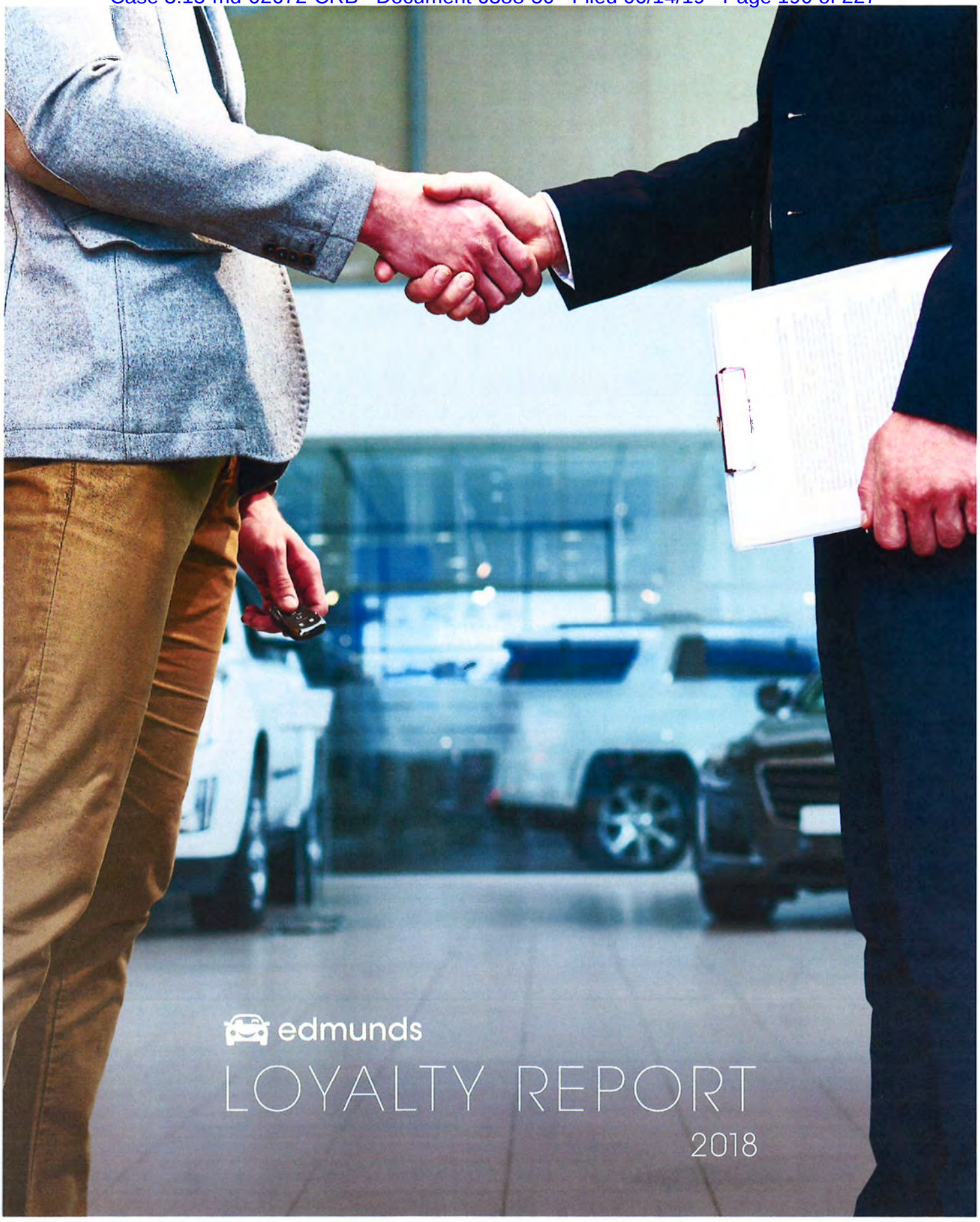
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LOYALTY REPORT
2018

Introduction: Why Buyer Loyalty Is More Critical Than Ever

The American auto industry is on the cusp of its most transformative period in history, marked by a battle on multiple fronts. On one side, automakers are attempting to anticipate demands of the future, developing autonomous and electric vehicle technology as the industry races toward the mobility revolution. On the other side, automakers are scurrying to address the changing tastes of today's car shoppers by shifting investment away from passenger cars in favor of SUVs and trucks.

Instability in the short term could severely jeopardize the future success of automakers. Due to the glut of new SUVs on the market and the creation of new segment niches, automakers are faced with the immediate challenge of maintaining a base of buyers at a time when nameplate loyalty no longer holds the weight it once did. While it's critical for automakers to continue to demonstrate that they're looking toward an electric and autonomous future, they must avoid being too farsighted. With sales continuing to cool off from record highs, customer loyalty is of the utmost importance to automakers in order to maintain current sales and market share — and to fund their expensive visions for the future.

In this report, we examined more than 13.9 million vehicle transactions to delve deep into what drives buyer loyalty at both the segment and the brand level. We uncover the reasons why shoppers have made such a dramatic pivot away from passenger cars toward SUVs. We call out the specific manufacturers that are managing to attract buyers to their passenger cars, and how that's giving them an edge in overall buyer loyalty. We name the specific brands, both mainstream and luxury, that are doing the best job at keeping car shoppers in their brand family — and call out exactly what they're doing right.

Report Methodology

All the numbers in this report are the percentages of vehicles traded in to purchase the same segment, manufacturer, brand or vehicle. Edmunds analysts believe that looking at the data from the angle of trade-ins rather than vehicles purchased is the truest form of buyer loyalty because it excludes conquesting, which can also be seen as an equally or more desired outcome. This study includes data from 2007 to 2017 and our analysis of more than 13.9 million transactions in the U.S. Lease returns were excluded from this study.

The Shopper Shift From Cars to SUVs: How Did We Get Here?

The loyalty rates for cars and SUVs have shifted noticeably in the past decade. Just before the start of the recession, SUVs had a fairly loyal following. But once the recession hit in 2008 and gas prices reached record levels, these shoppers quickly turned their backs on their big gas guzzlers, driving passenger car loyalty to record highs and SUV loyalty to record lows. The Cash for Clunkers program further spurred this trend as shoppers traded in their SUVs for more efficient passenger cars. The U.S government also enacted tougher Corporate Average Fuel Economy (CAFE) mandates in an effort to prevent large gas-hungry vehicles from returning to the roadways, pressuring automakers to develop more environmentally friendly choices.

By the time the country slowly began to crawl out of the recession, automakers were ready to roll out smaller, more fuel-efficient truck and SUV choices. They were the perfect product at the perfect time, and passenger car loyalty plummeted. Edmunds anticipates that as soon as the end of 2018, loyalty for passenger cars could drop so low it would match loyalty to SUVs during the Cash For Clunkers period — a time when the U.S. government was actually paying people to turn them in.

The irony of the last decade is that had the recession not happened, and had automakers not been forced to develop more fuel-efficient SUV options, the segment may have stayed limited to just those buyers who preferred larger, truck-based SUVs. But the fact that market forces compelled automakers to create SUVs that drove and consumed fuel similar to passenger cars actually led to abandonment of the passenger car segment we're seeing today.

SEGMENT LOYAL BUYERS

Percent of owners who traded in one body style (car, SUV, or truck) to buy the same body style

SUVs Now Have Highest Segment Loyalty Rate

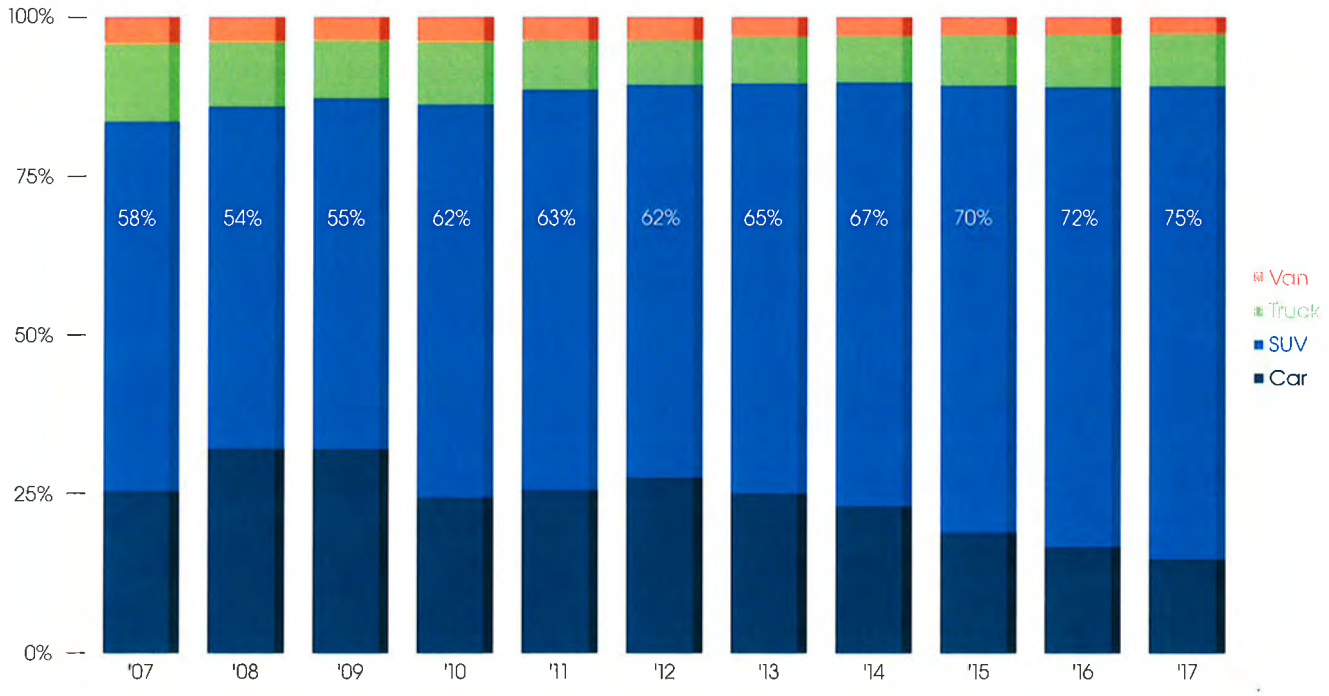
While historically truck buyers have been the most fiercely loyal to their segment, the growing number of SUVs on the market has given this segment the loyalty crown. In 2017, 75 percent of SUV owners who traded in their SUV to buy another new vehicle chose an SUV, compared to 57 percent of car owners who chose a car again for their next purchase and 74 percent of truck owners who traded in their truck for a new one. In fact, due to the breadth of SUV offerings of all sizes, the segment has developed into a funnel for buyers of all types — stealing business away from both cars and pickup trucks.

While segment loyalty for trucks remains high, it has leveled off in recent years, partly because there simply aren't as many model choices available for truck buyers as for SUV buyers.

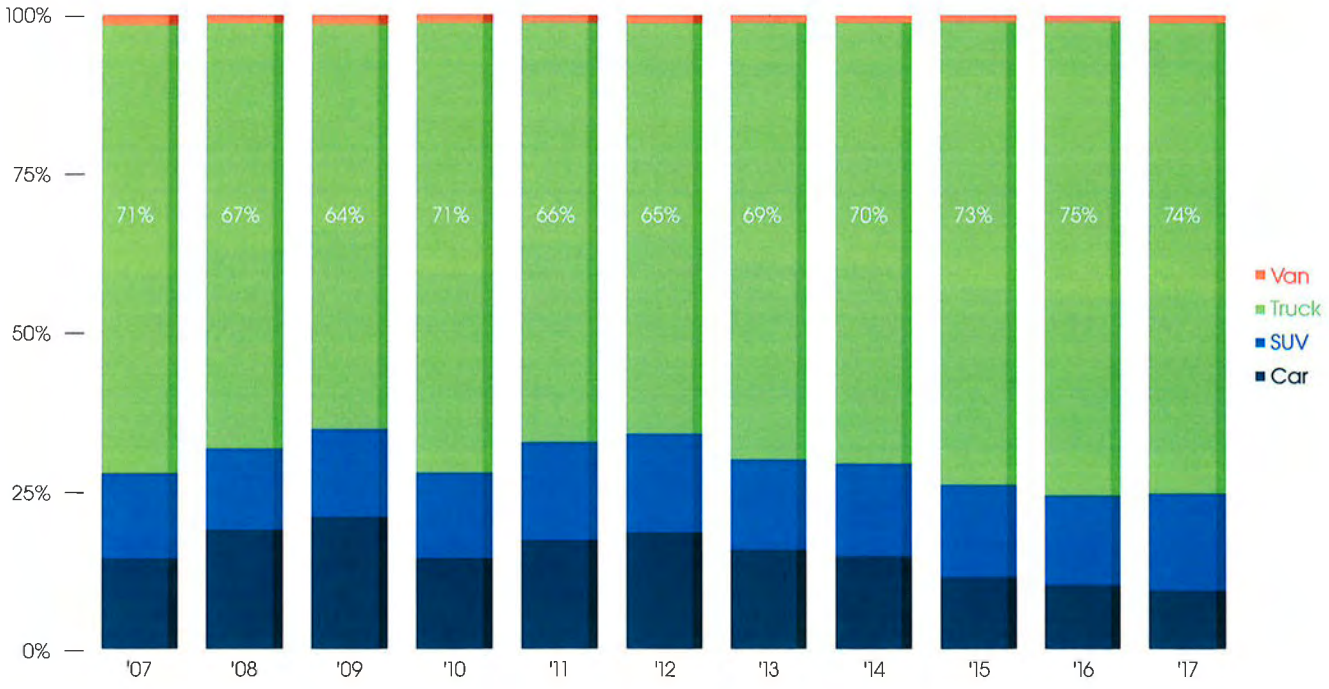
75%

of SUV owners traded in their SUV for a new one

VEHICLE TYPE PURCHASED WITH AN SUV TRADE-IN



VEHICLE TYPE PURCHASED WITH A TRUCK TRADE-IN



Passenger Cars in Crisis ...

In 2017, passenger cars accounted for 36 percent of all new vehicles sold. This is the lowest market share figure ever for cars and a noticeable decline from just five years ago when cars constituted half of the sales in new car market. The primary cause for this drop: In the last three years, millions of passenger car owners have traded their cars in for a truck or an SUV. In 2017, only one-third of all vehicles traded in went toward the purchase of a car; five years ago, the number was close to half. Slowing sales and lower margins have caused a few major automakers to either re-evaluate the passenger car segment or abandon it completely.

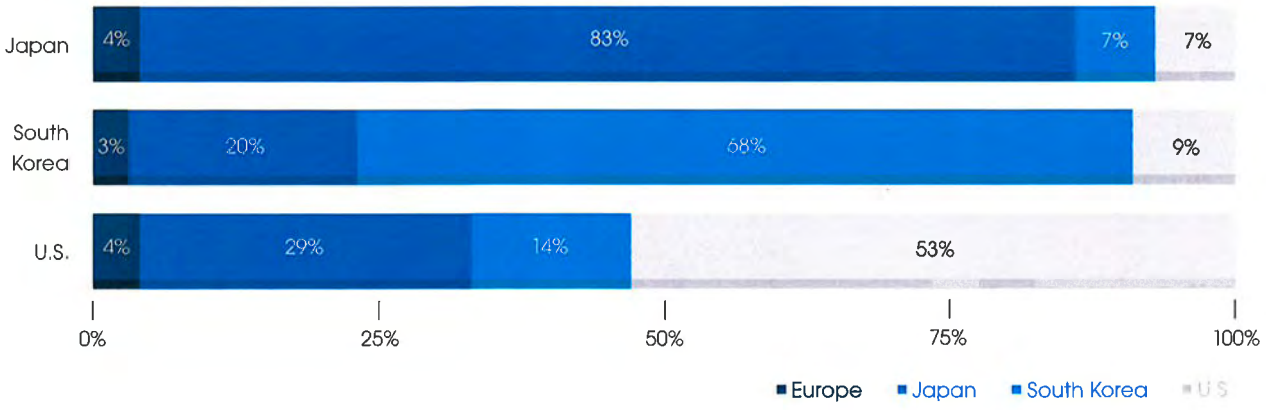
... But Not All of Them

While this signals a clear crisis for the passenger car segment, it doesn't mean cars will completely disappear. This shift has forced automakers to change their go-to-market strategy for passenger cars, designing products to appeal to buyer emotions rather than positioning cars as the pragmatic, cost-effective choice.

The Japanese automakers have found the most success so far with handling this pivot, but they are starting from a place of dominance — 50 percent of all car trade-ins in 2017 were from a Japanese brand. Companies such as Toyota and Honda built their business around producing the most reliable, cost-effective passenger cars, and they have kept buyers coming back by adding emotion into the equation. In 2017, 83 percent of people who traded in Japanese cars to purchase a new car bought a Japanese brand, compared to 53 percent for American brands. The high retention rate for Japanese brands bodes well for the recently redesigned Toyota Camry and Honda Accord, both long seen as the passenger car gold standard, and helps Toyota and Honda keep more buyers in their brands even as SUV loyalty becomes imperative.

CARS TRADED IN FOR CARS BY ORIGIN OF AUTOMAKER

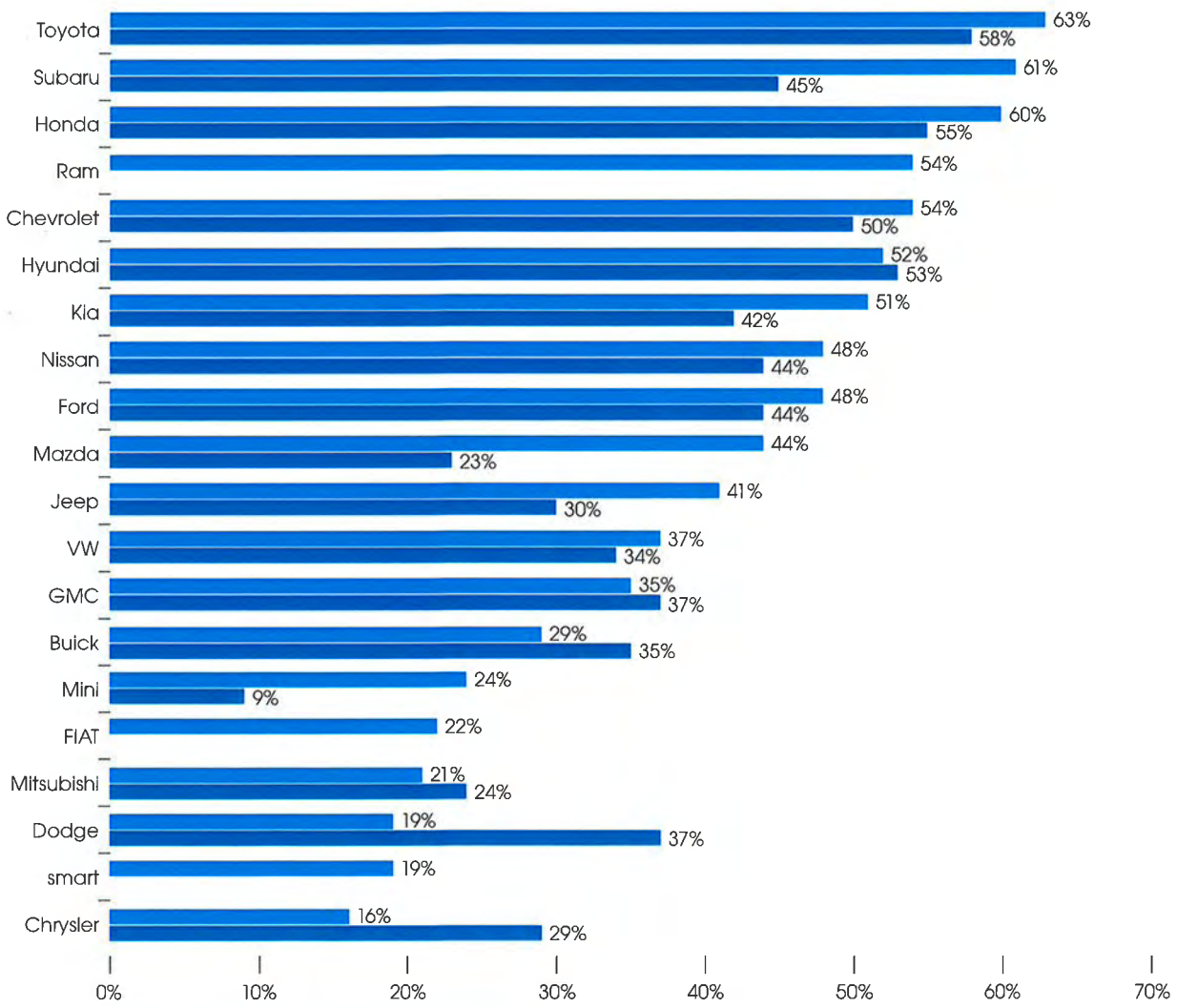
Cars of an automaker origin that were traded in for the purchase of a car by the same automaker origin. This chart covers passenger cars only, excluding data for both trucks and SUVs



Mainstream Brand Loyalty: Passenger Car Success Helps Boost Toyota, Honda

VEHICLES TRADED IN FOR THE PURCHASE OF THE SAME BRAND

The percent of vehicles traded in to purchase the same brand
(e.g., 63 percent of Toyota trade-ins went toward the purchase of a new Toyota)



Top of the Pack

Both Toyota and Honda have built reputations for quality and reliability that resonate with purchasers who are looking to keep their vehicle for an extended period of time. Their full model lines do a good job of keeping customers in the family. But not only that, the two automakers also report the highest model-to-model loyalty rates in many segments. Camry and Accord stand at the very top of the midsize segment while their SUVs are also near the top of their respective segments. In fact, 44 percent of both RAV4 and CR-V trade-ins are applied toward new ones.

Most Improved

Subaru has not only moved to the top of the pack but has witnessed its loyalty rate climb from 45 percent a decade ago to 61 percent in 2017. Similarly, Mazda has nearly doubled its rate of customer retention, capturing sales from 44 percent of people who traded in its vehicles in 2017. Mazda also has the distinction of having the vehicle with the highest number of return customers of any single vehicle in 2017 with its CX-5. The common thread between the success of these two brands is that they quickly moved away from cars and anchored their lineups with many SUV options. These new or reimagined offerings have helped them both keep previous car owners in their fold. There's been discussion that Subaru loses buyers to the pickup truck segment, but in reality, less than 6 percent of Subaru customers traded in their vehicle for a pickup truck. Its retention rate shows that its current SUV lineup serves its buyer base well — for the time being.

Bottom of the Pack Suffers From Strategy Shifts

Dodge and Chrysler, under the FCA umbrella, have made long-term strategic changes to boost profitability. Both brands have undergone a product overhaul, phasing out car nameplates to focus on their light-truck offerings. Owners looking to stay in the car segment return to dealer lots with few options and consequently defect to other brands, and neither brand has many compelling SUV options for shoppers to trade up to. From a corporate standpoint, this strategy isn't as risky as it seems since FCA's other volume brands, Ram and Jeep, have high or growing loyalty rates due to their comprehensive lineups of trucks and SUVs. In 2017, 50 percent of FCA's trade-in customers stayed within the FCA family.

Up-and-Coming

After a challenging past few years encapsulated in its emissions scandal, we expect Volkswagen to show notable gains in owner retention in 2018. As we've seen for other brands, VW's new SUVs — the all-new Atlas and the redesigned Tiguan — should move the needle in the positive direction for the German company.

Luxury Loyalty Hits New Lows

Buyer loyalty from a trade-in perspective has historically always been lower for luxury brands than for mainstream brands, but it's been dropping steadily for the last three years and in 2017 hit its lowest point since 2009. In 2017, only 37 percent of luxury buyers traded in their vehicle for one from the same brand compared to 40 percent three years prior.

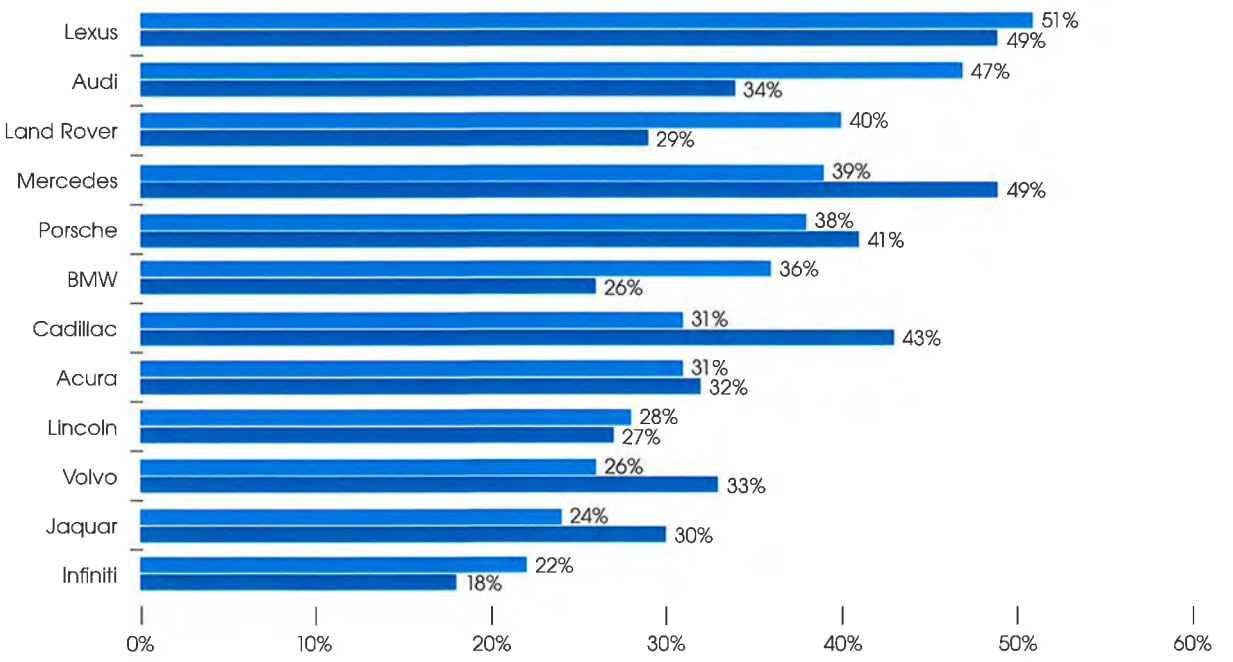
37%

luxury buyers traded in their vehicle for one from the same brand

Similar to the phenomenon on the mainstream side, luxury owners are making the jump to SUVs in record numbers. Luxury car defection rates are 10 percent higher than those for luxury SUVs, so buyers making the jump are a prime opportunity to pluck away market share from competition. In 2017 owners who traded in a luxury vehicle to purchase another luxury brand bought an SUV 59 percent of the time.

LUXURY: VEHICLES TRADED IN FOR THE PURCHASE OF THE SAME BRAND

The percent of vehicles traded in to purchase the same brand
(e.g., 51 percent of Lexus trade-ins went toward the purchase of a new Lexus)



Top of the Pack

Following the path of Toyota, Lexus leads the luxury segment in both car and SUV loyalty (46 percent and 55 percent, respectively). Though the brand doesn't boast a reputation for flashiness or performance, its renown for comfort and reliability resonates with owners. Two of Lexus' enduring nameplates, the ES and RX, bolster the brand's loyalty immensely. Audi, on the other hand, has made massive strides in market share and that success has been matched by soaring loyalty levels. The same push in design and appointments that has expanded Audi's market share has also helped keep existing owners in the fold. Audi has the luxury segment's second-highest loyalty for both cars and SUVs behind Lexus (44 percent and 54 percent, respectively)

Bottom of the Pack Shows Promise of Improvement in the Near Future

Infiniti's loyalty levels have been on the rise but still significantly trail the luxury average. Encouragingly, Infiniti's growing lineup of SUVs has proven to be more effective than its cars at keeping owners in the brand (26 percent SUV loyalty; 19 percent car loyalty). As these nameplates take root, they can cultivate future loyalty for the brand. Jaguar, with strong sales growth of late, is waiting for some positive movement on the loyalty side. Its first SUV, the F-Pace, has become a landing spot for many competitor trade-ins but hasn't yet swayed the Jaguar loyalists. With more time — and more SUVs on the horizon — Jaguar can expect loyalty to grow as their owners settle into the new diversity of model options.

Subcompact Luxury: An Experiment Gone Right

While the race among luxury brands has heated up to lure shoppers away from one another, luxury's latest entrants — subcompact cars and subcompact SUVs — have proven adept at persuading mainstream-brand shoppers to make the jump into luxury. In fact, nearly half of all trade-ins for luxury subcompact cars and SUVs are from non-luxury brands. These products have revitalized the luxury segment, bringing the next generation of luxury owners into the fold amid automakers' hopes they stick around for subsequent vehicle purchases.

The smallest luxury vehicles are unique in that they are the only portion of the luxury market bringing in non-luxury buyers. Besides the infusion of these new luxury converts, this segment is also appealing to luxury owners of older vehicles. With transaction prices rising steeply, these lower entry points let them remain in luxury for less.

In Closing: This Is Not a Pre-Bankruptcy Repeat

Strategies heavy on trucks and SUVs can breathe fear into those who witnessed the U.S. automotive collapse of 2008, but the irony is that the recession was a catalyst for the success of the current generation of SUVs. Today's SUV landscape is the result of finding an equilibrium. In 2004, the pendulum swung too far in favor of monster SUVs, and in 2008 it moved to other extreme to tiny fuel sippers. It's no surprise the right-sized choice was somewhere in the middle. Although automakers face a battle for market share, they are delivering what consumers want while achieving the margins needed to be successful.

Unfortunately, it's not all sunshine and rainbows. Defection rates make it easy to see why car lineups, the staple of the American auto industry for decades, are in jeopardy. However, it's not so simple since companies that have severed car lines have watched customers defect to competing brands. The automotive business is moving quickly into uncharted territory, and automakers are forced to make critical product decisions without much of a roadmap. They are placing big bets on the future in which traditional volumes targets are not guaranteed. The stakes grow even higher when product uncertainty is combined with the gamble on autonomy and electrification. Automakers today must address the issue of preserving loyalty as shopper demand shifts away from cars to ensure they are viable players in the future.

Total 2.0 Liter TDI Vehicles Removed from Market

		Count
	Subject Vehicles*	487,532
	Closed Buybacks	358,980
	UIO Scrapped	1,254
	Closed Early Lease Terminations	11,458
	Canada-registered Vehicles	910
(1)	Subtotal	372,602
	Other Vehicles**	18,318
(2)	Half of Other Vehicles category	9,159
(3)	Total 2.0L TDI Vehicles Removed from Market***	381,761
(1) + (2)		

* DOJ Consent Decree stated that the number is 499,406 vehicles less scrapped vehicles as of 10/1/15.

** The population of Other Vehicles includes certain fleet vehicles associated with completed Buyback or Early Lease Termination appointments, and certain completed AEMs on vehicles that were part of Volkswagen dealers' or port stock at the time Volkswagen issued the stop-sale order in response to the notices of violation.

*** Assumes that half of "Other Vehicles" were removed from the market.

SOURCE: The Fontana Group, Inc.
DATA: Claims Supervisor Report, 11/26/2018.
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Total 3.0 Liter TDI Vehicles Removed from Market

		Count
	Subject Vehicles	19,602
	Closed Buybacks	13,922
	UIO Scrapped/Consumer Export	259
	Closed Trade-ins	1,927
(1)	Subtotal	16,108
(2)	Other Vehicles*	98
(3) (1) + (2)	Total 3.0L TDI Vehicles Removed from Market	16,206
(4)	Percentage of 3.0L TDI Vehicles that are Volkswagen	50.8%
(5) (3) * (4)	Total Volkswagen 3.0L TDI Vehicles Removed from Market	8,233

* The "Other Vehicles" category represents vehicles Volkswagen has removed from commerce outside of the Claims Program. This includes, among others, used vehicles that Volkswagen acquired from dealerships and company cars previously utilized by Volkswagen employees that have since been retired.

SOURCE: The Fontana Group, Inc.
DATA: Claims Supervisor Report, 12/13/2018.
Manufacturer Generation 1 VIN-Level File (Magnetic Media).
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Estimated Midpoint of 2.0L TDI Consumer Settlement Buybacks Using Cumulative Closed Appointments*

Total 2.0L TDI Vehicles Removed from Market: 381,761
Midpoint: 190,881

Date	Cumulative Closed Appointments*	
12/18/2016	10,961	
1/22/2017	77,705	
2/18/2017	137,985	
3/19/2017	193,722	Estimated Midpoint
4/18/2017	246,162	
5/18/2017	271,776	

* Owners and Current Lessees who elected a Buyback or Early Lease Termination.

SOURCE: The Fontana Group, Inc.
DATA: Claims Supervisor Report, 5/25/2017 and 11/26/2018.
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VERTICAL INTEGRATION AND ANTITRUST POLICY

JOSEPH J. SPENGLER
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This man went down to his house justified.—LUKE 18:14

RECENT decisions suggest that the United States Supreme Court is beginning to look upon integration as illegal per se[1] under the antitrust laws. It may be presumed, in so far as this inference is valid, that the Court believes that integration necessarily reduces competition "unreasonably."[2] No sharp distinction is made by the Court between vertical and horizontal integration.

It is the purpose of this note to show that the Court is mistaken in its implied assumption respecting the influence of integration upon competition. Horizontal integration may, and frequently does, make for higher prices and a less satisfactory allocation of resources than does pure or workable competition. Vertical integration, on the contrary, does not, as such, serve to reduce competition and may, if the economy is already ridden by deviations from competition, operate to intensify competition. My argument will be confined largely to this last proposition.

I

Let us assume a product that, upon passing through three successive stages of production, A, B, C, is ready for sale to consumers. Suppose, further, that there is no vertical integration of stages; that each stage of production is completed by an independent firm; that the variable agents utilized in each stage are forthcoming under conditions of perfectly elastic supply; that each firm sells its product under conditions of pure competition; and that the nonvariable and/or entrepreneurial assets invested in each firm earn a minimum necessary "profit" per unit of output.

Let P_a, P_b, and P_c represent the selling prices, respectively, of the products of firms in stages A, B, and C. Let V_a, V_b, and V_c represent the variable costs per unit, respectively, of the products of firms in stages A, B, and C, with marginal cost (i.e., M_a, M_b, M_c) equal to average variable cost in each stage and at all relevant levels of output. Accordingly, since the product distributed to consumers at the termination of stage C by firms in this stage embodies the variable outlays per unit made in each stage, together with the minimum necessary "profit" per unit, this product will be sold, under the conditions stipulated, at price P_c. This price is made up of variable cost per unit $V_a + V_b + V_c$, together with the cumulated minimum necessary "profit."

Under conditions such as those given, entrepreneurs will be without incentive to integrate the activities of their firms with those in preceding and succeeding stages. For vertical integration as such would neither reduce cost per unit in any stage nor make possible the realization of greater "profit." Accordingly, it is a matter of indifference to consumers and producers alike whether integration is effected or not.

II

Now let the conditions stated in Section I be modified. Let the stages remain vertically unintegrated, with variable costs subject to the stipulations made above. But let it be assumed that enough horizontal integration

[1] A restraint of trade is describable as illegal per se under our antitrust laws if, in the opinion of the highest court, this restraint is unlawful in and of itself. The per se doctrine has been used most frequently in the past in cases involving price-fixing. Recourse to this doctrine is made attractive by the fact that its use enables the Court to avoid the so-called ambiguities of the "rule of reason."

[2] Documentation is supplied by M. A. Adelman in his "Integration and the Antitrust Laws," *Harvard Law Review*, LXIII (1949), 27–77, esp. pp. 52–54, 56, 76. See also his "The A & P Case: A Study in Applied Economic Theory," *Quarterly Journal of Economics*, LXIII (1949), 244–46.

has been achieved *within* each of the three stages to enable the firms composing each stage to sell at supracompetitive prices and earn supracompetitive profit per unit. Let the profit actually realized per unit by representative firms in each stage be R_a, R_b, and R_c; let variable costs incurred in each stage be represented by V_a, V_b, and V_c; and let total variable costs to firms in each stage be represented by C_a ($= V_a$), C_b ($= V_b + P_a$), and C_c ($= V_c + P_b$). Accordingly, $P_a = C_a + R_a$; $P_b = C_b + R_b$; and $P_c = C_c + R_c$. The consumer of the product moving out of stage C now pays for it a price per unit that exceeds the former per unit price by $R_a + R_b + R_c$ minus the cumulated minimum necessary profit per unit.

What has been said is illustrated in Figure 1. Demand curves D_a, D_b, and D_c confront representative firms in stages A, B, and C, in each of which, it is supposed, *horizontal* integration has proceeded far enough to cause the firm's marginal revenue curve to fall faster than its demand curve. Our representative firm in stage A (at the bottom of the chart) produces $Q = 40$ units of product at an average ($=$ marginal) cost of $V_a = 20$. These 40 units are sold to a representative firm in stage B (see middle of chart) at price $P_a = 30$, which thus includes a profit of 10 per unit; for P_a on demand curve D_a corresponds to the inter-

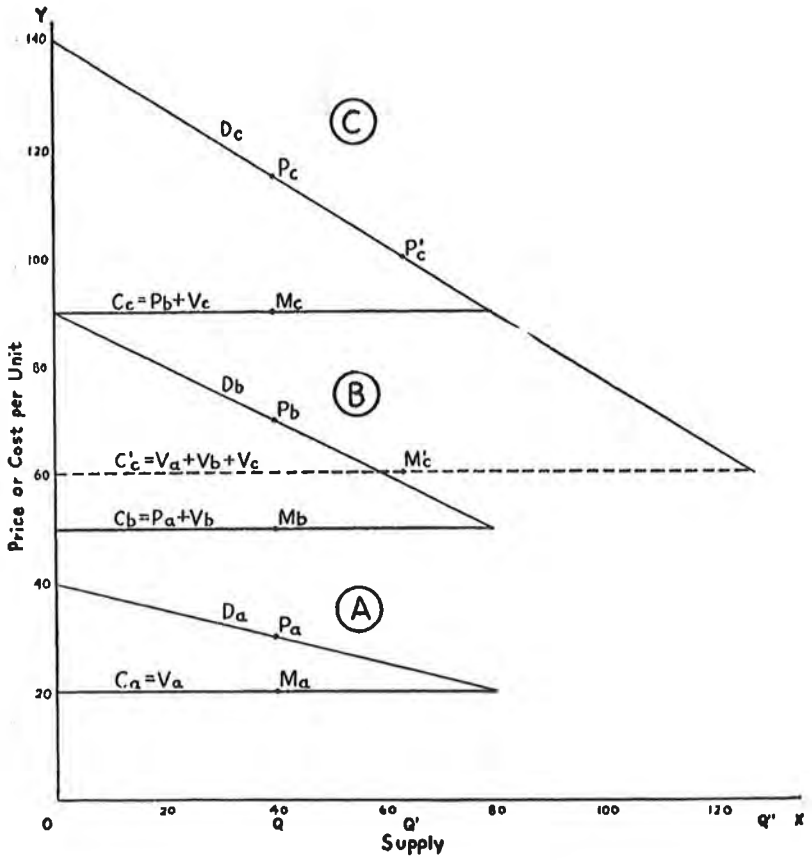

FIG. 1

section of marginal cost curve C_a (= V_a) by the undrawn[3] marginal revenue curve at point M_a. The firm in stage B combines with a unit of product from stage A a variable input of V_b = 20. Accordingly, the marginal (= average) cost of producing a unit of B is C_b (= $P_a + V_b$), or 50. The output Q (= 40) of the representative firm in stage B in turn is sold to representative firms in stage C at a price of P_b = 70, which thus includes a profit of 20 per unit; for P_b is the point on D_b corresponding to the intersection of marginal cost curve C_b by the undrawn marginal revenue curve at point M_b. The representative firm in stage C (see top of chart) combines with a unit of B costing P_b (= 70) a variable input V_c (= 20), thereby incurring a marginal (= average) cost of C_c (= $P_b + V_c$), or 90 per unit. The stage C firm in turn markets its output Q (= 40) to consumers of C at price P_c (= 115), which includes a profit of 25 per unit; for P_c is the point on D_c corresponding to the intersection of marginal cost curve C_c by the undrawn marginal revenue curve at point M_c.

Let us summarize the transactions described. The final price of a unit of product C, P_c (= 115), is made up of variable cost $V_a + V_b + V_c$ (= 20 + 20 + 20) and profit $R_a + R_b + R_c$ (= 10 + 20 + 25). Since, given the assumed coefficients of production, the output in each stage is always Q (= 40) units per firm, the aggregate variable cost of the 40 units of C is 2,400, the aggregate profit is 2,200, and the aggregate sales value is 4,600. Under the conditions of Section I, P_c would equal $V_a + V_b + V_c$ plus the minimum profit per unit necessary in stages A, B, and C; the volume of output and sales, therefore, would be much greater than under the conditions of Section II. If, for example, each stage C firm were confronted by a demand curve D_c and required to sell the amount which would equate average cost and average revenue, it would produce and sell much more than Q (= 40), but less than Q'' (= 128), the amount salable when minimum required profit is zero and price asked is C_c' (= 60).

The changed circumstances of sale introduced in stages A, B, and C under the conditions of Section II have enabled the firms in each of these stages to impose a surcharge in excess of the profit required under the conditions of Section I. This surcharge always exceeds the Section I minimum necessary profit, when expressed in per unit terms. Whether, however, the aggregate amount of this surcharge is greater relative to entrepreneurial investment than was the aggregate minimum necessary profit supposed in Section I turns on the ease of entry, aggressiveness of selling, etc., along with other Section II conditions.[4] The reduction in output and sales, together with the increase in price and profit per unit, which accompanied the replacement of the conditions of Section I by those of Section II, is attributable to the deviations from competition produced in stages A, B, and C. These deviations, we shall suppose, had their origin in the degree of increase in *horizontal* integration implied by the change in conditions. Of course, how much horizontal integration needs to be supposed depends, *ceteris paribus*, on the amount of product and/or customer differentiation assumed.

III

In Sections I and II, firms in stages A, B,

[3] The marginal revenue curves corresponding to demand curves D_a, D_b, and D_c have not been drawn because their presence would clutter up the chart. The points of intersection of these marginal revenue curves with relevant marginal cost (= average cost) curves are indicated by points M_a, M_b, and M_c in stages A, B, and C, respectively. The profit-maximizing prices, P_a, P_b, and P_c, are found, therefore, at the points on D_a, D_b, and D_c which correspond to M_a, M_b, and M_c.

[4] E.g., see J. Robinson, *Economics of Imperfect Competition* (London: Macmillan & Co., 1933), chap. vii; and E. Chamberlin, *The Theory of Monopolistic Competition* (3d ed.; Cambridge: Harvard University Press, 1938), chap. v. In a sense the model I have employed implies a degree of ease of entry that may appear to be inconsistent with the use to which the model has been put. This model, it must be kept in mind, however, is intended merely to describe how vertical integration may bring about a better use of resources along the lines indicated in Section III below.

and C were vertically unintegrated. Let us retain the degree of horizontal integration implied in Section II and the resulting individual firm demand curves (D_a, D_b, and D_c) obtaining in stages A, B, and C. But let us also suppose that a representative firm in stage A, together with one in stage B, is integrated with one in stage C. We shall use for illustrative purposes the data summarized in Figure 1. Vertical integration, under the conditions assumed, it will be shown, benefits both producer and consumer.

It being assumed that the object of the integrated firm is to maximize return above variable outlay, it follows that this firm will lower the price of its product at the completion of stage C below $P_c = 115$. Of course, the integrated firm might seek, as did the unintegrated firms, in Section II, to maximize profit within each stage and to transfer product from stage A to stage B at price P_a and from stage B to stage C at price P_b. If such an interdepartmental transfer-price and costing policy were followed, the profit realizable in stage C would remain as before, $Q(P_c - M_c)$, or 1,000; and the aggregate profit in all three stages would remain as before, $Q[P_c - (V_a + V_b + V_c)]$, or 2,200. This aggregate is less, however, than the aggregate which is realizable, namely, $Q'(P'_c - M'_c)$, or 2,560. The constant *variable* costs per unit of output in stages A, B, and C of the integrated firm are, respectively, V_a, V_b, and V_c. The aggregate *variable* cost per unit at the close of stage C is $C'_c(= V_a + V_b + V_c)$, or $M'_c(= 60)$. $P'_c(= 100)$ is the point on D_c corresponding to the intersection of the marginal (= average) cost curve C'_c by the undrawn marginal revenue curve at M'_c. At price P'_c consumers purchase $Q'(= 64)$ units of C, expending thereupon $P'Q'(= 100 \times 64)$, of which 2,560 represents "profit" (i.e., return above variable expense) and 3,840 represents variable expense.

Under the conditions assumed both the consumers and the firm benefit. Aggregate consumers' surplus (in the Marshallian sense) increases by 780.[5] Aggregate "profit" (i.e., return above variable expense) increases from 2,200 to 2,560.

Realization of this increase in "profit," given the cost conditions assumed, is possible only so long as the demand for C (i.e., D_c) remains sufficiently elastic. Thus, in the case in hand, the decline in price from P_c to P'_c (i.e., from 115 to 100) was accompanied by a sufficiently greater relative increase in output from Q to Q' (i.e., from 40 to 64). Under all cases conceivable, however, within the framework here employed, the elasticity of demand for a later-stage (e.g., C) product is sufficiently elastic to make price reduction consequent upon vertical integration under circumstances such as were assumed in Figure 1. This conclusion is easily illustrated. If marginal cost is zero, price will not be reduced, under conditions of imperfect competition, below the level at which demand is unitarily elastic. Accordingly, if cost and therefore marginal revenue are positive, the profit-maximizing price will be found at a point where demand is more than unitarily elastic. In general, every increment in cost, whatsoever its origin, is accompanied by a relatively greater increment in the elasticity of demand at the associated profit-maximizing price. Such increment in cost may have its origin in the introduction of horizontal integration (or equivalent competition-suppressing measures) in earlier stages. If this be the case, vertical integration of theretofore unintegrated stages of production can make for increases in both aggregate profit and "consumers' surplus." Moreover, *ceteris paribus*, the greater the "monopolistic" surcharges being levied in earlier stages and the higher the variable cost in later stages, the more elastic will be the demand confronting a representative newly and vertically integrated later-stage firm, and the greater will be the price reductions this firm finds advisable.[6]

[5] I.e., by $Q(P_c - P'_c) + [(Q' - Q)(P_c - P'_c)\frac{1}{2}]$.

[6] Let p represent the profit-maximizing price; r, the marginal revenue corresponding to p; c, the marginal cost when the volume of sales is such as to make $c = r$; e, elasticity of demand at p; e', elasticity of demand at price $p + \Delta p$. Then $e = p/p-r$; and when, the firm being in equilibrium, $r = c$, $e = p/p-c$, and $p = c(e/e-1)$. An increment (Δc) in cost

It has been shown that when a noncompetitive seller is able, by discrimination or monopsonistic practices, to evade payment of some of the rents which, under competition, pass to scarce factors, this seller will produce and sell more than when he is required to pay the rents in question.[7] But, in the absence of a not very likely combination of rent evasion and economies of scale, he will produce and sell less than a producer operating under conditions of pure competition. We have ruled out economies of scale because they are irrelevant to the main problem here under consideration. Even so, the case presented earlier resembles cases in which an imperfectly competitive seller, having evaded rents, asks lower prices. For our vertically integrated producer has been enabled, through vertical integration, to evade the rentlike "monopolistic" surcharges being imposed by sellers situated in earlier stages of production. Vertical integration, in short, has permitted our producer to evade imposts generated by horizontal integration and similar arrangements and thus reduce his selling prices below the level that would obtain in the absence of vertical integration. Vertical integration serves, therefore, to make price structures and factor allocation more ideal than they otherwise would be in an imperfectly competitive world.

Vertical integration can be made the consumer-saving answer to diverse "nuisance" taxes and "monopoly"-price-fixing arrangements that have been established by federal and state governments (e.g., "fair trade" acts, federal farm price supports, etc.). For vertical integration permits evasion of transfers which, because they involve change of ownership, subject the transaction to regulation. Thus a great vertically integrated concern, whether private or a consumers' co-operative, should be able to operate much more economically than can a chain of nonintegrated concerns, since the integrated concern can evade the many monopolistic surcharges and governmental taxes and cost-increasing restrictions incident at points where ownership is transferred. On this matter, the experience of economies that have employed turnover taxes is of some interest.

IV

At the outset of this paper, I indicated that the United States Supreme Court is evidencing some disposition to look upon integration as unreasonably restrictive of competition, be that integration horizontal or vertical. Consideration of the nature of competition discloses it to be horizontal rather than vertical in character, this in fact being the kernel of truth in theories of noncompeting groups.[8] It follows, accordingly, that horizontal integration may, if it is carried far enough, serve to reduce competition. It does not follow, however, that horizontal integration is describable as illegal per se under our antitrust laws when they are interpreted in the light of economic analysis. Here, above all, there is need for recourse to the rule of reason. For, given economies of scale and firm elasticities of actual and potential supply of particular commodities, horizontal integration reduces workable competition only after it has been carried beyond a certain point.

Vertical integration, as such, does not necessarily suppress competition. While reduction of competition is sometimes associated with the extension of vertical integration, analysis usually discloses such reduction, if in fact it exists, to be largely the fruit

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c (originating in a monopolistic surcharge or otherwise) is always accompanied by a relatively greater increment Δc in c. For example, given a straight-line demand curve, an increment of change (Δp) in p is accompanied by an increment of change (Δr) in r double that in p (i.e., $\Delta r = 2\,\Delta p$). Accordingly, suppose that, with $r = c = 0$, we increase c (and therefore r) by Δc. Then c, which had a value of unity when $r\,(=c)$ had a zero value, increases to $c' = p + \Delta p/p - 2\Delta p$, the rise in c approximating $3\Delta p/p$. When $r = c > 0$, the relative rise in c attendant upon a given increase Δc in cost (= revenue) is greater still, varying directly with the magnitude of c.

[7] E.g., see Robinson, *op. cit.*, chaps. xi, xxiii.

[8] Not all "horizontal" economic relationships are competitive, nor is it always easy to determine in what "layer" to place members of particular groups.

of *horizontal* integration and/or related arrangements. Qualifying adjectives have been introduced to allow for the supposition that, when vertical integration exists, transfer prices from some divisions to others of an integrated concern may be too high in the light of costs and/or alternative supply prices. Yet, even if this be the case, it will make for higher prices only if the end-product is sold in an imperfectly competitive world or if, the firm's demand being imperfectly competitive, it overestimates true costs and underestimates elasticity of demand.

Of great importance is the conclusion, developed earlier, that in an imperfectly competitive world vertical integration enables the higher-stage producer to evade "monopolistic" surcharges imposed by suppliers in lower stages, thus putting him in a position where he finds it advantageous to ask lower prices than would be asked in the absence of vertical integration and in the presence of existing horizontal integration. It follows that vertical integration, if unaccompanied by a competition-suppressing amount of horizontal integration and if conducive to cost and price reduction, should be looked upon with favor by a court interested in lower prices and a better allocation of resources. It should not be viewed as illegal *per se*, or as in unreasonable restraint of trade, unless the presence of significant horizontal elements makes it so. And if this be the case, it is the horizontal elements that need be singled out for remedial treatment.

Dealer and Manufacturer Margins

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Dealer and manufacturer margins

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When retail dealerships carry only one product line, the size of the dealer margin is crucial to the success of both the manufacturer and the dealer. This article proposes a successive monopoly model of patterns in exclusive dealer and manufacturer margins across a product line. The predictions of the model then are compared with the pricing practices of a major U.S. automobile manufacturer and its dealers. The data support a special case of our theory. Our analysis also indicates that we cannot reject the hypothesis that the retail demand curves for these models are (locally) linear. Finally, we use the margin data to provide updated evidence on the extent to which retail prices depart from list price.

1. Introduction

■ Many firms sell their products through a network of independent dealers. A common form of independent manufacturer-dealer relationship is one where the dealer carries only one manufacturer's product line.[1] In these exclusive dealer arrangements, the manufacturer's profit is affected by the dealer's pricing practices because the dealer's prices determine the volume of final sales. The manufacturer does have some control over what the final price (and volume) will be, but only to the extent that the manufacturer affects the dealer's costs by setting wholesale delivery prices. This vertical supply arrangement between manufacturer and dealer clearly is a situation in which each side would prefer that the other did not have the power to set price independently.

The differences between dealers' and manufacturers' incentives in setting prices, and the inability of most manufacturers to gain control over retail price, raise an intriguing set of questions about the patterns of dealer and manufacturer margins that are observed in the automobile industry. In automobile retailing it is common knowledge that on larger cars, wholesale prices are a smaller percentage of retail prices.[2] Further, there appears to be

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[1] Exclusive dealerships occur in such diverse markets as those for cars, sewing machines, agricultural machinery, and gasoline. For further examples and a discussion of the contractural and marketing practices associated with these relationships, see Ridgway (1969, pp. 117–121).

[2] For example, in 1968 dealer discounts on "full-sized" models were approximately 25%, while those on subcompacts averaged 17%. More recently, dealer discounts have been 12–15% in small-car lines and in the 19–25% range on full-sized or luxury cars. (See White (1971, p. 106), Teahen (1980), and the series of articles by Teahen in the October and November 1976 issues of *Automotive News*.)

a nearly *proportional* relation between the manufacturer's margin and the dealer's margin across the product line.[3] These facts form an interesting puzzle. Whatever one's explanation is for departures from marginal-cost pricing by automobile manufacturers, one must be able to explain why a similar pattern of product-line pricing should be adopted by dealers who often have substantially different profit incentives from those of the manufacturer.[4] In particular, why should the ratio of manufacturer to dealer margins be virtually independent of the size of the car and the relevant price elasticities and cross price elasticities of demand?

This article proposes a market power explanation of rent distribution between dealer and manufacturer. The formal model treats the relationship between manufacturer and dealer as an extension of the canonical successive monopoly problem that is discussed in the vertical integration literature.[5] Our model differs from previous models, however, because it considers the existence of product lines. Under very weak assumptions about the system of demand equations for the products in the entire line, the model provides an equilibrium explanation of the proportionality between automobile manufacturer and dealer margins. Finally, we use data on a major U.S. automobile manufacturer's product line to show that the results of the model are consistent with wholesale and retail automobile pricing. We conclude by providing updated evidence on the extent to which retail prices depart from list prices.

2. The successive monopoly model

■ This section outlines the structure of canonical successive monopoly problems and the economic assumptions underlying our successive monopoly model. The next section contains the analysis of this model.

We begin by assuming that the retail demand for the N products[6] in a manufacturer's product line is described by a vector of N demand functions that are at least twice differentiable,

$$P = D(Q) = (D_1(Q), D_2(Q), \ldots, D_N(Q)), \qquad \text{where} \qquad Q = (Q_1, Q_2, \ldots, Q_N). \quad (1)$$

For simplicity, we assume that there is only one manufacturer and that these are the demand functions of a representative dealer.[7] The manufacturer is assumed to have constant unit costs of production, m_j, for each product, j. The dealer is also assumed to have constant marginal selling costs, s_j, for each product.[8] When setting their prices, the manufacturer and the dealer act sequentially. The dealer is a follower relative to the manufacturer and takes the wholesale prices, w_j, as given. The manufacturer considers the dealer's pricing policies when setting the wholesale price because wholesale prices affect the dealer's costs. Although this leader-follower market power relationship clearly cannot be expected to apply to all exclusive dealer distribution relationships, below we shall indicate that for the most part it matches the institutional features of automobile retailing.

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[3] The proportionality of margins will be demonstrated below. For an example of the stylized facts on manufacturer margins, see *The New York Times* (January 20, 1980, p. 1).

[4] Pashigian (1961) and White (1971) discuss this conflict of incentives and the means by which manufacturers have historically sought to provide dealers with the "correct" incentives.

[5] For early definitions of the problem, see Lerner (1934), McKenzie (1951), and Machlup and Taber (1960). More modern treatments appear in Kerr, McGuire, and Staelin (1980), and Greenhut and Ohta (1979). In keeping with this literature, we assume that the "downstream" firm uses the "upstream" firm's output in fixed proportion to its own. (For the importance of this technological assumption, see Waterson (1982).) This technological assumption also is convenient because it allows us to ignore the variability (but not the level) of sales effort in dealer unit costs.

[6] The scope and styling of the product line are assumed fixed.

[7] The extension of the model to multiple dealers is discussed in footnote 13 below.

[8] Fixed costs are assumed to be less than revenues minus variable costs in equilibrium. The results of the theory would be identical with constant marginal costs everywhere replaced by marginal costs evaluated at the equilibrium quantities. In this slightly more general model, however, comparative statics with respect to cost are substantially more complicated.

The independent dealer's decision problem is given by

$$\max_{Q} \Pi^d = \sum_j Q_j(D_j(Q) - w_j - s_j). \tag{2}$$

That is, the dealer chooses an optimal number of units to sell as a function of its costs, $Q = Q(w + s)$. Written in inverse form, $w = W(Q)$ is the vector of demand curves faced by the manufacturer. Note that each of the manufacturer's demand curves will involve marginal revenue terms from the dealer's decision problem. The manufacturer then solves the problem

$$\max_{Q} \Pi^m = \sum_j Q_j(W_j(Q) - m_j) \tag{3}$$

with the dealer's behavior in problem (2) taken as given. Thus, the manufacturer and dealer are in a leader-follower relationship.

This formulation of the relationship between manufacturer and dealer clearly makes some assumptions about the nature of intra- and interbrand competition. First, it presumes *exclusive dealing*. Each dealer sells the products of only one manufacturer. Second, it presumes *exclusive territories*. Because the dealer faces the same demand curve at retail as would a manufacturer who owned the dealership, the manufacturer must have granted exclusive market rights to the dealer. Note, however, that this formulation does not presume *literal monopoly*. In an oligopolistic or a monopolistically competitive market, $D(Q)$ can be interpreted as a firm-specific demand curve.[9]

Finally, this formulation also makes assumptions about the kinds of contracts that can arise between manufacturers and dealers. The retail prices that arise in equilibrium are obviously not joint profit-maximizing prices. We do not model the historical, institutional, and legal considerations that prevent manufacturers and dealers from writing contracts to circumvent coordination problems.[10] Indeed, Smith's (1982) analysis suggests that manufacturers and dealers face substantial coordination problems for a variety of historical and legal reasons. We also do not attempt to design optimal incentive contracts when the manufacturer has complete discretion in delegating pricing responsibilities (cf. Lal and Staelin (1981)). Instead, we take the institutional detail as fixed, and attempt to characterize the dealer's and the manufacturer's optimal margin policies.

3. The analysis of the successive monopoly problem

■ The solution of the model is decomposed into two problems: the dealer's selling problem and the manufacturer's pricing problem. The solution to the dealer's problem (2) is the $Q^*(w + s)$ that solves

$$D_i(Q) + \sum_j Q_j \frac{\partial D_j(Q)}{\partial Q_i} = w_i + s_i \qquad \text{for} \qquad i = 1, 2, \ldots, N. \tag{4}$$

That is, retail marginal revenue ($MR_i(Q)$) for the ith product is equal to the dealer's marginal cost, $w_i + s_i$. Note that in this multiproduct setting, MR_i is the derivative of total revenue over all products with respect to Q_i.

Using equation (4), we can now solve for the manufacturer's optimal wholesale price. The dealer's optimum implies that the wholesale demand curve is $w_i = W_i(Q) = MR_i(Q) - s_i$. Thus,

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[9] Greenhut and Ohta (1979) provide a proof of this for the single-product case by using two specific oligopoly solution concepts.

[10] Some contractual features that have the appearance of nonlinear pricing, such as "forcing," have occurred in automobile manufacturer-dealer relations in the past. Currently, however, many states prevent these practices with explicit legislation to protect automobile dealers. Smith (1982) provides an excellent discussion of the institutional and agency-theoretic restrictions on manufacturer-dealer relations in the case of automobiles.

$$\Pi^m = \sum_j Q_j(w_j - m_j)$$
$$= \sum_j Q_j(MR_j(Q) - s_j - m_j). \quad (5)$$

The solution to the manufacturer's problem is

$$MMR_i(Q) = MR_i(Q) - s_i + \sum_j Q_j \frac{\partial MR_j(Q)}{\partial Q_i} = m_i \quad \text{for} \quad i = 1, 2, \ldots, N. \quad (6)$$

Again, this is a first-order condition that sets marginal revenue equal to marginal cost. For convenience, we have labeled the left-hand side the manufacturer's revenue, $MMR_i(Q)$.

Finally, we define the object of the theory, the ratio of the dealer's and the manufacturer's margins. This is

$$\frac{P_i - (w_i + s_i)}{w_i - m_i} = \frac{P_i - MR_i(Q)}{w_i - MMR_i(Q)} = \frac{\sum_j Q_j[\partial D_j(Q)/\partial Q_i]}{\sum_j Q_j[\partial MR_j(Q)/\partial Q_i]} \quad \text{for} \quad i = 1, 2, \ldots, N. \quad (7)$$

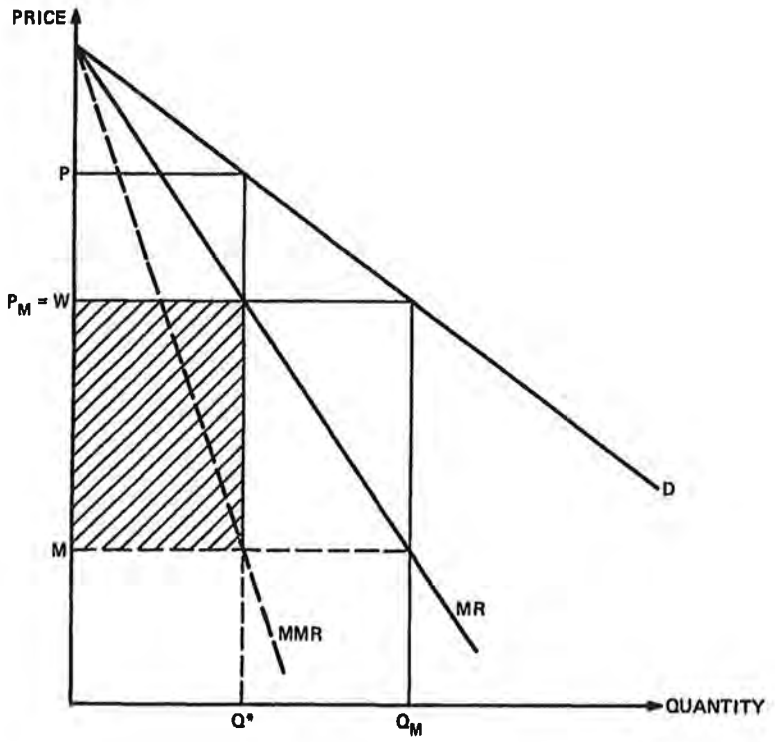
In the next two sections we characterize the properties of retail demand and the manufacturer-dealer leader-follower relationship that affect this summary measure of the distribution of rents.

4. The single-product case

■ Several important features of this successive monopoly framework and equation (7) are most easily illustrated by considering the theory of successive monopoly when there is only one product. Figure 1 shows how the dealer's price policy and manufacturer's wholesale

FIGURE 1

THE MANUFACTURER'S PRICING PROBLEM



price policy interact. (In this figure the dealer's selling cost, s, is assumed to be zero.) From equation (5) we see that the manufacturer optimally sets its wholesale price by taking the dealer's (retail) marginal revenue curve as its demand schedule. In Figure 1 this decision is represented by the manufacturer's choosing w to maximize the shaded rectangle. Figure 1 also shows that the equilibrium outcome is not joint profit maximizing for the dealer and the manufacturer. The dealer sets a retail price that is based on the costs of w. In fact, production costs are only m, so that a retail price reduction would increase joint profits. A more precise statement of this "double margin" result can be obtained by specializing equation (7) to the single-product case. Upon doing so, we obtain a simple ratio measure of relative market power,

$$\frac{P-(w+s)}{w-m} = \frac{Q[dD(Q)/dQ]}{Q(dMR/dQ)} = \frac{\textit{slope of the demand curve}}{\textit{slope of the marginal revenue curve}} = \frac{\textit{slope of the dealer's demand curve}}{\textit{slope of the manufacturer's demand curve}}. \tag{8}$$

In other words, in equilibrium both manufacturer and dealer have market power in proportion to the slopes of the demand curves that they face. To see that equation (8) is a ratio measure of market power, one can transform (8) into a ratio of Lerner indexes. That is, by dividing the numerator and denominator of equation (8) by the effective demands (P and MR), we obtain a ratio of the elasticities of the dealer's and manufacturer's demand curves.

By further transforming equation (8), we obtain a more simple expression for the ratio of margins

$$\frac{Q(dD/dQ)}{2Q(dD/dQ)+Q^2(d^2D/dQ^2)} = \left(2+Q\frac{d^2D/dQ^2}{dD/dQ}\right)^{-1} = \frac{1}{2+\eta}, \tag{9}$$

where η is the quantity elasticity of the slope of the demand schedule.[11] Thus, the curvature of the retail demand function, as summarized by η, determines how far the dealer's margin is from the manufacturer's margin. From this equation we deduce a simple characterization of the distribution of rents between manufacturer and dealer.

Proposition 1. In a single-product manufacturer-dealer pricing arrangement, if the retail demand schedule is strictly convex (concave), then the dealer's margin over unit costs is greater (less) than one-half the manufacturer's margin.

Figure 2 provides a graphical interpretation of this proposition and equation (9). In this figure we have drawn for comparison a convex retail demand schedule and a linear demand schedule such that they are tangent at Q^*. At Q^* the slopes of the two different retail demand curves are the same, and the two retail (dealer's) marginal revenue schedules cross. Now consider the difference between the manufacturer's marginal revenue curve, MMR, and the dealer's marginal revenue curve, MR, for these two demand curves:

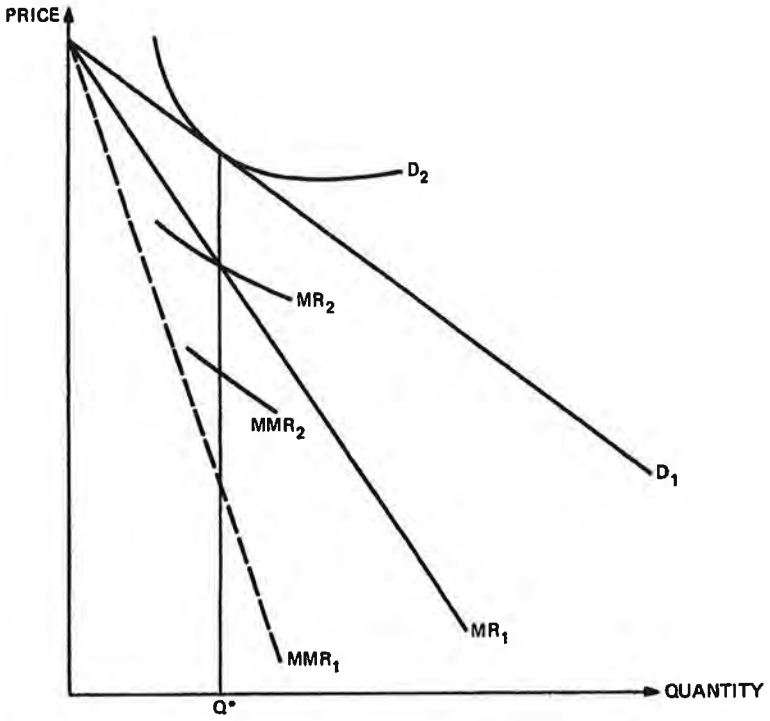
$$MMR(Q^*) - MR(Q^*) = Q^*\left(2\frac{dD(Q^*)}{dQ} + Q^*\frac{d^2D(Q^*)}{dQ^2}\right) < 0. \tag{10}$$

From (10) it is clear that the more convex the demand schedule at Q^*, the larger the last term in (10), and therefore the closer the manufacturer's marginal revenue function is to the dealer's marginal revenue function. Thus, an increase in the convexity of the demand schedule will tend to decrease the manufacturer's margin relative to the dealer's margin.

[11] Note that η is a local measure of the curvature of the retail demand curve. From expression (9) we can see that η is zero when the demand curve has no curvature (i.e., demand is linear). We also note that η will be a constant when the demand curves have the form $P = a + bQ^c$, where a, b, and c are constants.

FIGURE 2

MARGINAL REVENUE SCHEDULES FOR A LINEAR AND A CONVEX DEMAND CURVE



We can also compare our equation (8) with a result in Bulow and Pfleiderer (1982). They examined the comparative statics of a single-product monopolist who experiences a shift in his constant marginal cost function. They showed that the derivative of equilibrium price with respect to marginal cost was equal to the slope of the demand curve divided by the slope of the marginal revenue curve. Differentiating equation (4) in the single product case yields

$$\frac{\partial Q^*(w+s)}{\partial w} = \frac{\partial Q^*(w+s)}{\partial s} = \frac{1}{2(dP/dQ) + Q(d^2P/dQ^2)}. \tag{11}$$

We therefore conclude the following:

Proposition 2. In a single-product manufacturer-dealer pricing arrangement

$$\frac{P^* - (w^* + s)}{w^* - m} = \frac{\partial P^*(w)}{\partial w} = \frac{\partial P^*(s)}{\partial s}. \tag{12}$$

That is, at the optimum the ratio of the margins is equal to the change in the dealer's price when the manufacturer either changes its wholesale price (the dealer's unit cost) or the dealer's selling costs are changed.

Why should the ratio of the dealer's unit profit to the manufacturer's unit profit be equal to the sensitivity of the dealer's price to the manufacturer's wholesale price? The simplest way to understand this relation is to consider the manufacturer's choice of w. At the margin the manufacturer maximizes profits by choosing w so that

$$\Delta Q(w - m) = -Q\Delta w,$$

where Δ denotes a small change in the relevant variable. Or, in words, the change in sales

volume due to a change in the wholesale price just equals the change in revenue due to inframarginal customers. The dealer confronts a similar profit maximization tradeoff. The dealer must balance volume against a retail price change

$$\Delta Q(P - w - s) = -Q\Delta P.$$

Given that the manufacturer and dealer are in a leader-follower relationship, it follows that equation (12) is simply the ratio of these two conditions. In words, if the manufacturer chooses to change its wholesale price in equilibrium, then the relative costs of such an increase to the dealer and the manufacturer must exactly balance the relative gains to each. In this sense equation (12) is a measure of the dealer's market power relative to the manufacturer's market power.

Finally, we note that these single-product results provide one possible interpretation of the proportionality of automobile manufacturer-dealer margins noted in the Introduction. If the products in the manufacturer's product line are independent in demand (that is, $P_i = D_i(Q_i)$), then

Proposition 3. If the quantity elasticity of D_i is the same for all products and the products are independent in demand, then the ratio of the dealer's margin to the manufacturer's margin is the same for all i.

5. The multiple-product case

■ When the product line consists of several products that are related in demand, both the manufacturer's and the dealer's problem grow more complex. Each must now take into account the relevant cross elasticities of demand. For example, the manufacturer must consider the dealer's price-setting behavior on all products when setting wholesale price on any particular product. Despite this added complexity, this section shows that, as in the single-product case, there is a readily interpretable curvature term that is central to the dealer-manufacturer margin ratio. Also, the precise relationship between the margin ratios and the comparative statics of the vertically integrated case still hold. The key difference in interpreting the results of the multiple-product case is that the conceptual experiments defining η now turn on making *proportional* changes in all quantities.

In the multiple-product case we assume symmetry[12] of the demand system. (That is, $[\partial D_j(Q)/\partial Q_i] = [\partial D_i(Q)/\partial Q_j]$.) Then equation (7) expands to

$$\frac{P_i - (w_i + s_i)}{w_i - m_i} = \frac{\sum_j Q_j[\partial D_j(Q)/\partial Q_i]}{2\sum_j Q_j[\partial D_j(Q)/\partial Q_i] + \sum_j \sum_k Q_j Q_k[\partial^2 D_j(Q)/\partial Q_i \partial Q_k]}. \quad (13)$$

Instead of taking the simple ratio form of (slope of demand)/(slope of MR), this expression has a more general weighted slope interpretation. Equation (13) also has an interpretation parallel to that of equation (9). Let

[12] Not all multiproduct demand functions have this property. In our application, the feature of automobile demand that implies symmetry is the 0–1 nature of demand by any single buyer. Each buyer's demand decision can be thought of as a large discrete-choice problem (see, for example, McFadden (1976)) over all of the possible types of automobiles. The demand for each type is given by the number of buyers for whom it is the most preferred car. Indexing the features of individual buyers that vary in the population by θ, we can express the demand for car j (as compared with other cars indexed by k) as: $Q_j = \int_{U_j(P_j,\theta) \geq U_k(P_k,\theta)\ \forall k} f(\theta)d\theta$, where $U_j(P_j, \theta)$ is the (indirect) utility of a buyer of type θ choosing car j and $f(\theta)$ is the density function of θ in the population of buyers. (The function $f(\theta)$ is not a probability density.) The derivative of Q_j with respect to P_i is $\partial Q_j/\partial P_i = \int_{U_j(P_j,\theta)=U_i(P_i,\theta)} [\partial U_i/\partial P_i] f(\theta)d\theta$. This derivative is equal $\partial Q_i/\partial P_j$ if the bracketed term in the integral is the same for i and j. This bracketed term, however, is the marginal utility of money conditional on buying car i. Since the marginal utility of money is evaluated at a point of equal utility (conditional on i or on j), symmetry follows.

$$\eta_i = \frac{\sum_j \sum_k Q_j Q_k [\partial^2 D_j(Q)/\partial Q_i \partial Q_k]}{\sum_j Q_j [\partial D_j(Q)/\partial Q_i]}. \tag{14}$$

Then

$$\frac{P_i - (w_i + s_i)}{w_i - m_i} = \frac{1}{2 + \eta_i}. \tag{15}$$

In the single-product case η was the quantity elasticity of the slope of the demand curve. In this multiple-product case there is a similar interpretation. Define $\xi_j = \tau Q_j$ and $\xi = (\xi_1, \ldots, \xi_N)$. Variations in τ are equivalent to equiproportional changes in all quantities. Defining a new variable, f_i, as the quantity-weighted sum of the slopes of all the demand curves with respect to Q_i allows us to rewrite η in elasticity form using the following expressions:

$$f_i = \sum_j Q_j \frac{\partial D_j(\xi)}{\partial Q_i}$$

and

$$\frac{\partial f_i}{\partial \tau} = \sum_j \sum_k Q_j Q_k \frac{\partial^2 D_j(\xi)}{\partial Q_i \partial Q_k}.$$

Evaluating this expression at $\tau = 1$ and converting it to an elasticity give

$$\left.\frac{\partial f_i \tau}{\partial \tau f_i}\right|_{\tau=1} = \frac{\sum_j \sum_k Q_j Q_k [\partial^2 D_j(Q)/\partial Q_i \partial Q_k]}{\sum_j Q_j [\partial D_j(Q)/\partial Q_i]} = \eta_i. \tag{16}$$

That is, η_i is the elasticity of f_i with respect to a proportional change in all quantities. If an equiproportional increase in all sales increases all of the f_i by the same percent, then η_i will not depend on i.

The above results now enable us to state multiple-product generalizations of the single-product results summarized in Proposition 1.[13]

Proposition 4. In a multiproduct manufacturer-dealer pricing arrangement, the ratio of the dealer's to the manufacturer's margin on each product is determined by η_i. If the demand system is linear, the dealer's margin will be one-half the manufacturer's margin on each product. If a proportional increase in all quantities would increase (decrease) the weighted impact of Q_i on the prices of all products, then the dealer's margin on product i will be (less) greater than one-half of the manufacturer's margin.

6. An example with dealer price discrimination

■ This section discusses an application of the theory to the pricing of automobile options. This example illustrates how the theory can be applied to situations where dealers and manufacturers use product options to extend product lines.

Many multiproduct firms choose to offer different quality levels to price discriminate among customers. Quality variations and product bundling are profitable strategies if, for example, those customers who are most willing to pay for the basic product are also those

[13] It is also possible to prove an analogue of Proposition 2. The extension of the model to multiple dealers, however, is tedious and requires further assumptions about the degree of spatial competition among dealers. It is possible, however, to show that the basic form of equation (9) is readily preserved if price is reinterpreted as the price of a particular dealer. Because the manufacturer's margin in the denominator is (approximately) uniform across dealers, it is also possible to reinterpret the average dealer margin as a form of average of the η's of the individual dealer demand curves. This inverse form of averaging affects the interpretation of η in equation (9) if there is substantial heterogeneity in the curvatures of individual dealer's demand curves. We return to this issue of potential spatial variations in dealer market power below in the empirical section.

consumers most willing to pay for the added quality or optional equipment (see, for example, Adams and Yellen (1976)). In automobile retailing, it is well known that automobile dealers' pricing policies are coordinated with the bundling of optional equipment. The question we consider here is what the manufacturer's margin policies on optional equipment are, given that the manufacturer supplies the dealer not only with the basic car but also with the optional equipment.

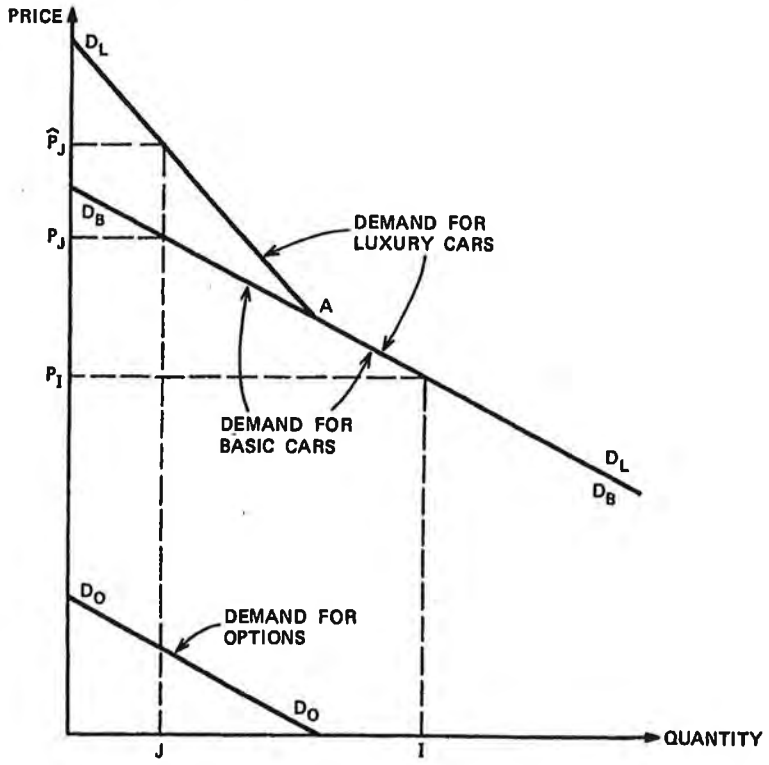
Let us assume that there are two basic products supplied by a dealer, "basic" cars and "luxury" cars. Let the demand curves for either only the basic or only the luxury car be piecewise linear as depicted in Figure 3. The demand curve $D_B - A - D_B$ represents the demand curve if only the basic car is offered. The demand curve $D_L - A - D_L$ represents the demand if only the luxury car is offered. By assuming that consumers' willingnesses-to-pay for each car are perfectly correlated, we obtain the joint demand curve pictured in Figure 3. To see the demand function for both cars (assuming they are both offered) note that the Jth-most willing-to-pay consumer values the basic car at P_J and the luxury car at $\hat{P}_J$. Similarly, the Ith most willing-to-pay customer would offer P_I for either a basic or a luxury car.

One way to analyze how the dealer and the manufacturer go about pricing the two cars (or the standard car and the optional equipment) is to apply directly the theory of the last few sections. If the manufacturing and distributing costs are such that both the basic and the luxury model are sold in equilibrium, and the demand system is (locally) linear, then we know that

$$\frac{P_B - (w_B + s_B)}{w_B - m_B} = \frac{P_L - (w_L + s_L)}{w_L - m_L} = \frac{1}{2}. \tag{17}$$

FIGURE 3

THE DEMAND FOR LUXURY OPTIONS



(Here the subscript B refers to the basic car and the subscript L refers to the luxury car.) That is, the manufacturer's and dealer's margins would be in the same proportion over the product line.

Another way to think about this problem, however, is to note that the perfect correlation of the demands for the two cars enables us to separate the standard/luxury-car pricing problem into a car-pricing problem and an option-pricing problem. That is, if $Q_L > 0$, we can write

$$P_L - P_B = P_O = D_O(Q_O)$$

as the relationship between the price of the option (the device that allows the consumer to "step up" to the better product) and the quantity of options sold. Similarly, if $Q_B > 0$, we can express the relationship between the price and the quantity of cars (standard cars plus luxury cars) sold as

$$P_B = D_B(Q_L + Q_B) = D_C(Q_C) = P_C,$$

where the function D_C is the same as D_B, and the price and quantity of cars take on the obvious definitions.

This reformulation leads to a second interpretation of Figure 3. The demand for cars is linear and depends only on P_C. Thus, the MR and MMR curves associated with $D_B - A - D_B$ determine the dealer's margin on cars. The demand curve $D_O - D_O$, obtained as the vertical subtraction of D_L and D_B, gives the demand for options and depends only on P_O. As long as prices are such that cars are sold both with and without options, this demand curve is linear. Thus, the dealer's margin on the price-discrimination device will also be half that of the manufacturer's margin. Therefore, in this example we can think of the dealer and the manufacturer either as being in an iterated monopoly relationship over the product line or as having both an iterated monopoly and an iterated price-discrimination relationship.

Finally, it is worth noting that the special assumptions of perfect correlation in consumers' willingnesses-to-pay and the existence of two products are not crucial to this example. For example, suppose that a multiproduct iterated monopoly has two specific products, i and j, that differ because one has an extra option. Suppose also that the demand curves are such that $\eta_i = \eta_j$. Then we know from the model that in equilibrium

$$\frac{P_i - (w_i + s_i)}{w_i - m_i} = \frac{P_j - (w_j + s_j)}{w_j - m_j} = \frac{1}{2 + \eta}. \tag{18}$$

That is, the markup ratio on the two products is the same. Therefore,

$$\frac{P_i - (w_i + s_i) - P_j + (w_j + s_j)}{w_i - m_i - w_j + m_j} = \frac{P_O - (w_O + s_O)}{w_O - m_O} = \frac{1}{2 + \eta}. \tag{19}$$

That is, the markup ratio on the option or price discrimination device is the same. Thus, the dealer's access to price discrimination devices such as options does not necessarily change the analysis if the price discrimination devices are bought from the manufacturer. In automobile retailing some of the most profitable price discrimination devices—engines, trim, and air conditioning—come from the manufacturer.[14]

7. Conclusion: evidence from the automobile market

■ Our theory of iterated monopoly has a number of idiosyncratic predictions. The most striking is that the ratio of the dealer's to the manufacturer's margin depends on the quantity

[14] There are other price discrimination devices, such as weatherproofing and other dealer "packs," that do not come from the manufacturer. These options, like the dealer's assessment of the buyer's income or eagerness, only affect retail and not wholesale price discrimination.

elasticity of the slope of the demand curve (the curvature of demand) and not on the slope of the demand curve. This is striking because if the curvature of the demand curve is held constant while the demand curve becomes steeper (for example, demand is linear or constant elasticity), then the dealer and the manufacturer share proportionately in the profits of this increased market power. We also know from the theory how this factor of proportionality varies with the curvature of demand. If demand is convex (concave), then the factor of proportionality is greater (less) than or equal to one-half. In this section we examine some of these empirical implications of the theory with automobile dealer and manufacturer margin data. In particular, we are interested in analyzing manufacturer and dealer margins across new car size classifications. We also report estimates of the extent of manufacturer and dealer discounting by size of the car, as well as some evidence that relative margins do not vary by size of the car.

Before describing margin policies in detail, we need to consider whether the characteristics of domestic new car distribution relationships match the assumptions of our model. In particular, it is necessary to question why manufacturers do not simply limit dealer market power by forcing cars on the dealer, crowding geographic areas with dealers, terminating dealers, and restricting supply. (Any of these practices, if effective, would suggest interesting alternative models of automobile margin data.) In essence, the reason automobile manufacturers do not engage in these practices is that in most states these practices are prohibited by law (see, for example, the discussion by Smith (1982)). Manufacturers are not allowed to own their own dealerships. Additionally, manufacturers may not legally terminate dealers without sufficient cause and cannot arbitrarily ration supply in the absence of work stoppages or acts of God. Although manufacturers do have some discretionary means for disciplining dealers, such as advertising allowances and service requirements, typically these are small components of the dealers' overall level of operations (see, for example, Pashigian (1961) or White (1971)).[15] The potentially powerful incentive device of putting selected dealers "on allocation" is also prevented by enhanced Robinson-Patman-type acts at the state level. Manufacturers typically must also show state licensing boards economic need before a new dealership can be established.[16]

In applying our successive monopoly interpretation to automobile manufacturer and dealer margins, it is also important to consider several other assumptions of our model. First, we assume that automobile dealers are exclusive dealers. Those dealerships that carry more than one domestic product line—so-called domestic intercorporate "duals"—are mostly found in small rural markets where the fixed costs of a dealership must be spread over many automobiles.[17] Nonrural dual dealers overwhelmingly carry a domestic brand and an import brand to offer a full line of automobiles; in the 1970s a "full line" came to include fuel-efficient models, largely supplied by import manufacturers. A second potential problem in proceeding from the theory to the data is potential heterogeneity in retail demand. The constant relative margin results of the theory do not generalize to a case in which dealers face different demand curves and manufacturers charge the same wholesale price to all dealers. The demand curve for a particular domestic brand of car is likely to be quite different in urban and rural markets, since the income, demographic, and car-use patterns of these areas are quite distinct. Because major metropolitan areas account for approximately four-fifths of total domestic car sales, however, we are willing to treat nationwide averages as approximating metropolitan area market margins.

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[15] Pashigian (1961, pp. 243–244) claims that selling costs often do not influence retail decisions because manufacturers encourage dealers to engage in "service absorption." Service absorption is a practice whereby dealers' gross margins on parts and initial service are set to cover the overall joint costs of selling the product line.

[16] As a result, dealers typically have exclusive territorial rights. See Smith (1982, pp. 132–137) for a discussion of dealers' successes in lobbying state governments into preserving territorial monopolies.

[17] On a nationwide basis 5.4% of GM dealers are dualled with a competitive domestic brand. For Ford and Chrysler these figures are 2.5% and 6.9%, respectively (Polk, 1983; U.S. Department of Commerce, 1983).

Finally, although the successive monopoly model does not presume literal monopoly, it does presume that the nature of competitive interactions is the same at the retail level as at the manufacturing level. Despite state laws that prevent manufacturers from proliferating dealerships at the expense of existing dealers, individual dealers in a metropolitan area may face flatter demand curves than would a manufacturer who vertically integrated to serve the entire metropolitan market. The theory in the previous sections can easily be expanded to deal with this possibility. Such competition only implies that dealer margins may be a smaller fraction of manufacturer margins (and does not necessarily affect proportionality of margins across the product line).

We have gathered data on manufacturing costs, wholesale prices, dealer selling costs, and retail list prices for fifteen (distinct) models in a single domestic manufacturer's product. These data reflect prices in effect during February, 1977. The manufacturing cost data are (nationwide) accounting marginal cost. Wholesale prices are the contractual nationwide transfer prices. These prices have been adjusted for the 2–3% "hold back" provision.[18] These figures were also standardized to include only engines and trim options. When one of the 15 models was available with more than one type of body style, trim, or engine, we calculated quantity-weighted average prices and costs. Thus, the manufacturer margins we calculate are very close to the constructs of the theory.

Dealer costs and prices are, of course, more difficult to quantify in this industry. Inventory costs are a substantial component of dealer marginal costs. These vary substantially by the size of the car. On average, dealers' variable costs are 35% of the dealer's gross margin (Davisson and Taggart, 1974, Chap. 3). This average was adjusted by the time models in each segment spend on the lot.[19] That is, we set $s_i = \lambda DI_i(P_i - w_i)$, where DI_i represents the average day's inventory of models in product i's segment and λ is set to ensure that the average s_i is 35% of $P_i - w_i$.[20] This adjustment accounts for most of the variation in dealer marginal costs by size of the car. Finally, our measure of dealer marginal cost, s_i, does not allocate dealer fixed costs across car lines.

We measured average retail price in two different ways. The first retail price series consists of suggested list prices in late February, 1977, adjusted for manufacturer rebates. The second retail price series consists of the lowest advertised prices for new cars in the San Jose, California, metropolitan area during three Sundays in Winter, 1977.[21] Clearly, neither list prices nor advertised prices are perfect indicators of average transactions prices. Below we discuss the limitations of these different price series and present some evidence that suggests that, even though list prices and advertised prices may depart from transactions prices, they do not do so in a way that affects our conclusions.

We now turn to an examination of the two stylized facts mentioned in the Introduction: dealer discounts are larger in percentage terms on more expensive models, and manufacturer's price-cost margins are substantially higher on the more expensive models.[22] Table 1 reports

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[18] The "hold back" is a percentage of the dealer's price and is often held by the manufacturer until the car is actually sold.

[19] This average was calculated for February from 1975 to 1979 from figures published in *Automotive News*.

[20] The effect of this calculation is to raise dealer marginal costs for full-size models and to lower them for small-size cars (compared with a constant 35%).

[21] San Jose is a large city in Northern California. The San Jose metropolitan area presently has a population of 1.3 million. The advertisements used in this study were placed in the area's largest paper, *The San Jose Mercury News*. These advertised prices are reasonably good estimates of retail prices because California dealers must have the advertised car on the lot and must be willing to sell the car at the advertised price. Because some cars that were advertised had noncomparable trimline and option packages, we adjusted w_i, m_i, and s_i to be the appropriate figure for that particular package. We did not attempt to value advertised interest rates or dealer contests ("Win a trip to Mazatlan" at one dealer and "Over $2500 in prizes" at another). Finally, the California prices differ from those in the first two columns by the "add-on" for California emissions equipment. (These add-ons amounted to between $60 and $80, depending on the model.) These add-ons were included in the P_i, m_i, and w_i used to construct the Table 2 regression.

TABLE 1 **Descriptive Dealer and Manufacturer Margin Regressions***

Dependent Variable	log $(w - m)$	log $(P - w - s)$
Constant	−7.77	−8.94
	(.988)	(.654)
log (w)	1.73	1.84
	(.119)	(.079)
R^2	.94	.98
N	15	15

* Coefficient standard errors are in parentheses. Retail prices are Spring 1977 U.S. average list retail prices adjusted for rebates. Wholesale prices are Spring 1977 contract prices, adjusted for the "holdback" described in the text. The source for both wholesale and retail prices are 1976 and 1977 issues of *Automotive News*. The manufacturer average variable cost figures are from manufacturer accounting data. Finally, dealer selling costs are constructed according to the procedures described in the text. (In constructing these selling costs we allocated transportation charges and dealer preparation charges according to the convention that they are part of the manufacturer's marginal cost. Both manufacturer and dealer accounting conventions treat them this way, as the manufacturer essentially "pays" the dealer for the preparation charges.)

a cross section summary regression of manufacturer and dealer (list) margins on wholesale prices. Column 1 is a descriptive regression of the manufacturer's margin on $\log(w_i)$. Column 2 is the same regression for the average dealer's margin. This table documents the stylized fact noted in the Introduction: the average dealer margin increases with the size of the car. Indeed, the results indicate that the dealer margins expand much more than proportionately relative to wholesale prices (as opposed to the wholesale margin discussed in our model). Table I also shows that the manufacturer's margin increases with the size (value) of the car, again more than proportionately. The conclusion we draw from Table 1 is that for this manufacturer and its average dealer the stylized facts about the *level* of the margins are true: both the dealer's market power and the manufacturer's market power vary substantially across the product line, with both dealer and manufacturer tending to have substantially more market power in the high-value vehicles. In fact, both dealer and manufacturer (list) margins are more than ten times as large on very expensive cars as on the most cheap subcompact models.

Given that manufacturer and dealer margins expand more than proportionately with the size of the car, we can now examine the stylized fact that the ratio of the dealer's to the manufacturer's margin is a constant. Table 2 presents a regression test of the proportionality in margins. We measure departures from proportionality by estimating the following logarithmic form (see equation (15)):

$$P_i - w_i - s_i = \alpha(w_i - m_i)^{\beta},$$

where departures from proportionality are measured by a β different from unity. If we initially assume that η_i is the same constant across the model line, then an estimate of η

[22] These regularities occur because the demand curves for models in the more expensive "full-sized" and "luxury" segments are steeper than those for "intermediates." The intermediates' demand curves in turn are typically steeper than those for "compact" or "subcompact" models. (See Bresnahan (1981) for an investigation of these margins.) Margins are larger for the full-size cars because they are less close substitutes for one another than compacts and subcompacts. (Presumably, the high fixed costs of design and tooling prevent the introduction of more large cars.)

TABLE 2 Hypothesis Tests*

	Dependent Variable			
	$\log (P - w - s)$ (1)	$\log ((P - w - s)/(w - m))$ (2)	$\log (P^a - w - s)$ (3)	$\log (P^a - w - s)$ (4)
Constant	−.347 (.439)	1.445 (1.361)	−.457 (.937)	−.406 (.865)
$\log (w - m)$	1.0197 (.066414)		1.042 (.152)	1.150 (.129)
Segment		.0677 (.057)		
$\log (w)$		−.104 (.184)		
R^2	.94	.15	.82	.83

* Coefficient standard errors are in parentheses. The retail price series are based upon the following sample periods and sources:

Columns (1) and (2): The sample period and variables are the same as those in Table 1.
Column (3): The sample period and the variables are the same as those in Table 1 except list prices have been replaced with a lowest advertised retail price. The lowest advertised retail price is the average of lowest advertised prices on February 20 and 27, 1977, in the San Jose, California, metropolitan area. An average was used because not all models were advertised on either of these days. (Source: *The San Jose Mercury News.*)
Column (4): The same variables as in column 3, except the average advertised price series is replaced with the lowest advertised price for January 23, 1977. (Source: *The San Jose Mercury News.*)

can also be recovered from the intercept. In the first column we report this regression. The hypothesis of proportionality in (list) margins is strongly supported. The coefficient of the manufacturer's margin is almost unity, and is very precisely estimated. The implied estimate of the ratio of the margins is .71, and we cannot reject the null hypothesis that the ratio is one-half, a situation where the implied demand curves are (locally) linear.

As a second test, we sought to detect whether any departures from proportionality were systematically related to size or segment class. The second column reports a regression that asks whether the ratio of dealer margins varies systematically with size or segment class. The dependent variable is the natural logarithm of the dealer's over the manufacturer's margin. The exogenous variables that measure size and segment class are $\log(w_l)$ and *SEG*, a variable which takes on the value 1 for subcompacts, 2 for compacts, and so on, up to 5 for luxury cars. Neither of these variables, both of which are highly correlated with the two margins, predicts the ratio of the margins. An additional regression that contained only dummy variables representing the segment classes indicated that there were no differences (at a 5% significance level) in the implicit estimates of the η's. We conclude that (at least for this manufacturer) the (list) dealer margin is proportional to the manufacturer margin across the product line.

An obvious criticism of these results is that they rely on list prices. Extensive discounting by dealers would confound our analysis if dealer discounts from list price were correlated with wholesale price margins. The third column of Table 2 shows our results when list prices, P_l, are replaced by lowest advertised prices, P_l^a, from *The San Jose Mercury News* for two Sundays in late February, 1977. We picked this time period because it immediately follows an adjustment of wholesale and retail (list) prices by manufacturers. Thus, it is likely that the normal, long-run equilibrium relationships between wholesale and retail transactions prices were in effect at this time. The lower intercept in column 3 suggests that Silicon Valley car shoppers could indeed find bargains in this period. There is, however, no important

departure from proportionality: $\beta = 1.042$. Thus, margins calculated from advertised prices, as well as list prices, exhibit proportionality.[23]

A reasonable sceptic could argue at this point that neither lowest advertised prices nor list prices are transactions prices (though California law makes it a near certainty that at least one car was actually sold at the advertised price). Clearly the law of one price does not hold for retail automobile markets, and there is substantial variation across buyers in transactions prices. But the reasonable sceptic needs to believe more than this. For our results to be biased, *both* list and advertised prices need to depart systematically from transactions prices in the same direction for either large or small cars. It is quite easy to construct an argument in which list prices are farther from transactions prices (in percentage terms) on the larger car models. But it will be quite difficult to make the same argument for advertised prices. For example, the average lowest advertised price in our data is about 94% of list. For the same period the average car sold nationwide retailed at 95% of list.[24]

Finally, we have some indirect evidence on the relationship between advertised and transactions prices that suggests that they are quite similar. This evidence also helps to explain why there are so many anecdotes about differences between list and transactions prices for automobiles. We picked late February, 1977, because list prices had just been adjusted to changing demand. The demand for large, fuel inefficient cars was unexpectedly strong in late 1976 and early 1977. Automobile manufacturers became capacity constrained in their large car lines and shut down their small car lines for inventory adjustment. During February, manufacturers either offered rebates on small cars or instituted permanent price increases on large cars and permanent price reductions on small cars. (See the February 7 and 14, 1977, stories in *Automotive News*.) In column 4 of Table 2, we reestimated our advertised-price margins regression by using data from just before this price adjustment. At that time, list retail prices (and thus wholesale prices) appeared to be out of equilibrium. The regression shows that dealer margins (on advertised prices) increased much more than proportionately to manufacturer margins in late January. This result is consistent with a shift in demand to large cars that was in turn reflected in retail prices.

This temporary phenomenon is confirmed by the experience of a journalist (Anderson, 1977). In the first week of February, he (anonymously) shopped extensively for new car prices at Los Angeles automobile dealers. He found dealers much more likely to offer discounts from "sticker" price on small cars than on large ones. At that time sticker prices reflected list prices that were set in November or December, 1976, when most of these cars were made. Thus, his investigation of dealer's offer prices is consistent with what we observed in the San Jose advertised price data. In particular, the advertised prices and proffered transactions prices depart from list in very similar ways. We, therefore, tentatively conclude that the successive monopoly theory provides an adequate description of long-run pricing policy in the automobile market. There remain, however, substantial fascinating puzzles in the short-run data. Among them are why list prices are so infrequently changed and why manufacturers let dealers earn such substantial rents on shifts in demand for such a long time.

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[23] It should be noted that the lowest advertised prices are usually more variable than list prices, as can be seen by the fact that the standard error of β is considerably higher in column 3.

[24] If every new car sold in 1977 through a dealer had been sold exactly at list, dealer's gross margins would have been nearly 19%. That is, total retail revenues of the sector would have been 1.189 times as large as total wholesale revenues. In that same year the average new car dealer earned a gross margin of just under 14% according to both the Accounting Corporation of America and the National Automobile Dealers Association. (There are several steps to this calculation. First, we calculated retail and wholesale revenues as the (weighted) sum of quantities sold times their list price. This calculation valued all trimlines and option packages at list price. To make this number comparable to February, 1977, we were forced to assume that the mix of trimlines and options sold over time (within 1977) was a constant. The calculation also adjusts for changes in the mix of models over time using monthly data on sales.)

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